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U.S. DEPARTMENT OF COMMERCE Environmental Science Services Administration Environmental Data Service



KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.317

Catalog of Meteorological Satellite Data-ESSA 3 and ESSA 5 Television Cloud Photography

January 1 - March 31, 1968





PURPOSE

The Key to Meteorological Records Documentation Series has been established to provide guidance information to research personnel making use of climatological data.

Frequently users of such data have found it necessary to spend a great deal of time establishing whether the criteria for observing or computing various elements have changed over the period of record or in what form the data are available.

It is therefore hoped that the presentation of this series may not only conserve valuable time but may have a direct influence in improving the accuracy of research results.

EARLIER TIROS AND ESSA DATA CATALOGS

Earlier catalogs of TIROS and ESSA Meteorological Satellite data are available in this series, as follows:

- No. 5.31 "Catalogue of Meteorological Satellite Data TIROS I Television Cloud Photography", published in 1961, price 70 cents.
- No. 5.32 "Catalogue of Meteorological Satellite Data TIROS II Television Cloud Photography", published in 1963, price 20 cents.
- No. 5.33 "Catalogue of Meteorological Satellite Data TIROS III Television Cloud Photography", published in 1962, price 70 cents.
- No. 5.34 "Catalogue of Meteorological Satellite Data TIROS IV Television Cloud Photography", published in 1963, price \$1.00.
- No. 5.35 "Catalogue of Meteorological Satellite Data TIROS V Television Cloud Photography", published in 1964, price \$1.75.
- No. 5.36 "Catalogue of Meteorological Satellite Data TIROS VI Television Cloud Photography", published in 1964, price \$2.00.
- No. 5.37 "Catalogue of Meteorological Satellite Data TIROS VII Television Cloud Photography Part 1 June 19, 1963 to December 31, 1963", published in 1965, price \$1.25.
- No. 5.37 "Catalogue of Meteorological Satellite Data TIROS VII Television Cloud Photography Part 2 January 1, 1964 to June 30, 1964", published in 1965, price \$1.00.
- No. 5.37 "Catalogue of Meteorological Satellite Data TIROS VII Television Cloud Photography Part 3 July 1, 1964 to December 30, 1964", published in 1965, price \$1.00.
- No. 5.37 "Catalogue of Meteorological Satellite Data TIROS VII Television Cloud Photography Part 4 January 1, 1965 to December 31, 1965", published in 1966, price 45 cents.
- No. 5.38 "Catalogue of Meteorological Satellite Data TIROS VIII Television Cloud Photography Part 1 December 21, 1963 to June 30, 1964", published in 1965, price \$1.00.
- No. 5.38 "Catalogue of Meteorological Satellite Data TIROS VIII Television Cloud Photography Part 2 July 1, 1964 to December 31, 1964", published in 1965, price \$1.00.

(Continued on inside back cover)



U.S. DEPARTMENT OF COMMERCE Maurice H. Stans, Secretary ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION Robert M. White, Administrator ENVIRONMENTAL DATA SERVICE Woodrow C. Jacobs, Director

KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.317

Catalog of Meteorological Satellite Data-ESSA 3 and ESSA 5 Television Cloud Photography

January 1-March 31, 1968

WASHINGTON, D.C. 1969

PREFACE

This issue in the series of catalogs describing the television cloud photographs obtained by meteorological satellites includes material taken from both ESSA 3 and ESSA 5. It covers the period of January, February, and March 1968. The maps and listings generally follow the pattern established in the "Catalog of Meteorological Satellite Data - TIROS I Television Cloud Photography," published as No. 5.31 in the Environmental Data Service Series Key to Meteorological Records Documentation. However, digitized cloud maps replace the manually constructed nephanalyses which had been used in previous catalogs. There are two maps for each day; the first polar stereographic projection in each set is for the Northern Hemisphere and the second for the Southern Hemisphere. These maps are arranged according to pass day.

Documentation Section
National Environmental Satellite Center

USING THE CATALOG

- 1. Scan the digitized cloud maps for areas of particular interest.
- When a picture of interest is located, the film can be ordered by date from the National Weather Records Center, Asheville, N. C., at a cost of \$8.50 per day.
- 3. Information for a particular pass, such as start time, subsatellite point (the point where the local vertical through the satellite intersects the earth's surface), and track number, may be determined by using the tabulated listings preceding the digitized cloud maps.

UDC 551.507.362.2:551.576:621.397.3:779(083.8)"1968-324"

551.5 Meteorology .507.362.2 Meteorological satellites .576 Clouds 621.3 Electrical engineering •397•3 Television picture analysis 77 Photography 779 Collections of photographs (083.8)Catalogs, lists "1968-324" Winter, 1968

CATALOG OF METEOROLOGICAL SATELLITE DATA ESSA 3 and ESSA 5 TELEVISION CLOUD PHOTOGRAPHY January 1, 1968 - March 31, 1968

The ESSA 3 meteorological satellite, launched on October 2, 1966 by the National Aeronautics and Space Administration, is the third Environmental Survey Satellite in the TIROS Operational (TOS) System. ESSA 3 was put into a nearly circular, sun-synchronous polar orbit, approximately 892 statute miles above the earth's surface with an apogee of 925 statute miles and a perigee of 859 statute miles. The orbit is inclined 79° (Retrograde) to the equatorial plane with a nodal period of 114.5 minutes which corresponds to slightly less than 13 circuits of the earth each day.

ESSA 3 is a TIROS type satellite in a "cartwheel" configuration which allows earthoriented picture coverage. The spacecraft is spin-stabilized and magnetically torqued to a
wheel attitude, so that the spin axis is normal to the plane of the orbit and the radially
mounted cameras view the earth once during each spacecraft revolution about its axis.

The cameras in the ESSA 3 satellite are one inch diameter vidicons (television camera tube) of the Advanced Vidicon Camera System (AVCS) type. Each picture covers an area of approximately 4,000,000 square miles. One camera provides full global coverage, therefore, two cameras provide full system redundancy.

Each of the cameras can independently take pictures and store them for later playback to one of the Command-and-Data-Acquisition (CDA) stations which are located at Wallops Station near Chincoteague, Va., and Gilmore Creek, Fairbanks, Alaska.

Pictures, taken every 260 seconds, are usually obtained in sequences of twelve frames to a pass. Each frame is electronically gridded by computer with latitude and longitude lines and geographic outlines merged with the picture. An identification legend underneath each picture provides the following information: year, month, day, hour, minute and second of picture taking time; track and zone numbers; station initial; satellite number; mode; camera; latitude of a labeled grid intersection near the picture center; latitude spacing of grids in degrees; longitude of a labeled grid intersection near the picture center; longitude spacing of grids in degrees; pass number; frame number; and sun glint position. The picture, figure 1, is located in the area of track 1 (TABLE 1) zone 70 (not referenced), with the latitude and longitude point of the picture located at 65°N and 55°W. The grids are spaced 5° both in latitude and longitude and sun glint is shown in the picture at 59°N and 60°W.

For ESSA 3 the system of "TRACKS" is used to identify the general geographic areas over which picture sequences were taken. These tracks are listed in the ESSA 3 track table (TABLE 1) which appears in this catalog immediately following the tabulated listings. The track boundaries are parallel to the path followed by the subsatellite point during the day-light portion of each orbital pass. The width of each track is exactly equal to the amount the earth rotates between consecutive passes. Thus, in general, the subsatellite point makes one traverse along each track each day (from midnight to midnight, GMT). The track boundaries are fixed permanently for the life of ESSA 3, and are arbitrarily referenced to the point 0° latitude, 0° longitude, with track numbers increasing westward.

Since the ESSA 3 orbital period of 114.5 minutes is not an exact submultiple of 24 hours, the satellite starts 12 and 13 passes on alternate days. This results in track 13 being much narrower than the others and, thus, it is not traversed every day. There are also days on which one particular track is traversed just after GMT midnight, and again later the same day just before GMT midnight.

The ESSA 5 meteorological satellite, launched on April 20, 1967, has characteristic features similar to ESSA 3. When pictures from ESSA 5 more nearly fit the operational requirements for data they are combined with pictures from ESSA 3 in the digitized cloud maps.

ESSA 5, like ESSA 3, was put into a nearly circular polar orbit, approximately 892 statute miles above the earth's surface, with an apogee of 922 statute miles and a perigee



Figure 1 - Example of ESSA 5 Cloud Photography
ESSA 3 similar

of 861 statute miles. The orbit inclines 78.42° to the equatorial plane with an orbital period of 113.6 minutes which corresponds to 12.7 passes around the earth each day.

The cameras in the ESSA 5 satellite are of the same design as those in the ESSA 3 satellite. Picture coverage of the entire sunlit area of the earth is possible each day. Each camera can independently take pictures and store them on tape for later playback to a CDA station in the same manner as ESSA 3 photos.

Pictures, taken at 260 seconds, are in sequences of 6 or 12 frames to a pass, each frame being electronically gridded to show latitude, longitude and geographic outlines on the picture. The grids are generally spaced at 5° intervals of latitude and longitude. The identification legend underneath each picture supplies all pertinent information.

The "track" system of ESSA 5 is similar to that of ESSA 3 and track boundaries are fixed for the life of the satellite. They are used to identify the geographic areas over which picture sequences were taken. These tracks are listed in the ESSA 5 track table (TABLE 2) which immediately follows the ESSA 3 track table (TABLE 1).

Since the ESSA 5 orbital period of 113.6 minutes is not an exact multiple of 24 hours, the satellite starts 12 and 13 passes on alternate days. This results in track 13 being much narrower than the others and, thus, is not traversed every day. There also are days on which one particular track is traversed just after GMT midnight, and again later the same day just before GMT midnight.

On the film reels, picture sequences are grouped together by track number and assembled in chronological order. Track numbers are stamped on the film immediately preceding the sequence to which they apply.

The following pages of tabulated listings give descriptive information about the pictures obtained by ESSA 3 and ESSA 5. In the listings each picture sequence is described by one line, and the sequences are grouped together by date and track number. This is the order in which they appear on the film reel. The column headings and entries have the following meanings:

PASS: Orbital pass number on which the pictures were taken.

TRACK: Defines the geographic area which contains the path of the subsatellite point. The entries refer to TABLES 1 and 2.

C: Camera number indicated in the legend.

1 = Camera number one

2 = Camera number two

S: Command-and-Data-Acquisition (CDA) station which received the sequence.

W = Wallops Station, Va.

F = Fairbanks, Alaska

ALONG: Longitude of ascending node (equator crossing)

MODA: Month and day on which the pictures were taken.

HRMNSE: Time in hours, minutes and seconds of the first picture taken.

SUBSATELLITE POINT PICTURE LOCATION: Indicates the latitude in degrees of the subsatellite point for each of the twelve frames in the orbital pass sequence. First latitude column corresponds to picture frame No. 12

To prohibit operating temperatures from reaching a level considered possibly detrimental to spacecraft components, it was found necessary to tilt the ESSA 3 spacecraft from mission mode during the period January 1, 1968 through March 31, 1968. The tilt (approximately 15 to 20 degrees) reduced the usable picture area and caused gaps in coverage which are particularly apparent in the digital mosaics. To provide the user with a better indication of the areal extent and quality of the data available for this period, it was decided to replace the digital mosaics with picture mosaics in this catalog. The mosaics were prepared by combining individual gridded pictures (described earlier in the text) so that overlap along the track is largely removed and legending is retained for only the southernmost picture. It is important to note that pictures from each track (pass) are played back to the ground station from the spacecraft recorder in the reverse order to which they were taken. Frame 1 then is the last picture taken, and Frame 12 the first. The mosaic legend for each pass will always indicate a high frame number (11 or 12) for the southern picture. Subsequent catalogs in this series will again contain the digitized computer mapped photo-mosaics.

The basic ESSA 3 and ESSA 5 gridded picture master films are deposited at the National Weather Records Center (NWRC), Environmental Science Services Administration, Federal Building, Asheville, North Carolina 28801. Persons or institutions desiring copies may order them from the NWRC in the form of 35 mm. positive transparencies for projection or 35 mm. duplication negatives from which opaque copies can be made. Pictures should be ordered by date at a cost of \$8.50 per day which includes the digitized computer maps for each day ordered. The digitized computer maps consist of 16 images; eight polar stereographic octants, 6 Mercator segments and two reduced resolution polar hemispheric chips for each day. These digitized computer maps are also available separately on 100 foot reels, at \$8.50 per reel, with each reel containing approximately 22 days of the film chips. All copies will be furnished with sprocket holes, since the necessary film emulsion is available only in this form. It is not possible to furnish copies of individual frames or to provide enlargements or other formats.

Available also from the NWRC, for the cost of reproduction, are reels of microfilmed nephanalysis charts for TIROS thru ESSA 1.

- Bristor, C. L., Callicott, W. M., and Bradford, R. E.: "Operational Processing of Satellite Cloud Pictures by Computer," Monthly Weather Review, 94(8), August 1966, pp. 515-527.
- U. S. Department of Commerce, Environmental Science Services Administration, Environmental Data Service, "Catalog of Meteorological Satellite Data ESSA 3
 Television Cloud Photography, Part 2, January 1, 1967 to March 31, 1967."
 KMRD No. 5.313, Washington, D. C., 1967.

PASS	TRACK	С	s	ALON	MO DA	HRMNSE			SIIR	-SATEI	LITE	POINT	י פורד	URF I	OCATI	ON		
							LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT
5797 5798	7 8	2	W	177W 154E	01 07 01 07	001508 020945	76S 76S	77S 77S	67S 67S	54S 54S	41S 41S	28S 28S	14S 14S	1S 1S	12N 12N	25N 25N	38N 38N	51N 51N
5799 5800	9 10	2	W	126E 97E	01 07 01 07	040425 055908	76S 76S	77S 77S	67S 67S	54S 54S	41S 41S	28S 28S	14S 14S	1S 1S	1 2 N 1 2 N	25N 25N	38N 39N	51N 52N
5801	11	2	F	68E	01 07	075355	77S	77S	668	54S	40S	275	145	ON	12N	26N	39N	52N
5802 5803	12 13	2	F F	40E 11E	01 07 01 07	094844 114337	77S 77S	76S 76S	66S 65S	53S 52S	40S 39S	26S 26S	13S 12S	ON ON	13N 14N	26N 27N	40N 40N	53N 53N
5804	1	2	F	18W	01 07	133833	785	75S	648	518	388	25\$	118	1 N	15N	28N	41N	54N
5805 5806	2	5	F W	46W 75W	01 07 01 07	153312 172735	78S 77S	75S 76S	64S 65S	52S 52S	39S 39S	25S 26S	12S 12S	I N ON	14N 13N	27N 27N	41N 40N	54N 53N
5807 5808	4 5	2	F F	104W 132W	01 07 01 07	192202 211632	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 27S	13S 13S	ON ON	13N 12N	26N	39N 39N	52N 52N
5809	6	2	F	161W	01 07	231105	77S	77S	668	54S	418	275	145	ON	12N	26N	39N	52N
5810 5811	7 8	2	W	170E 142E	01 08 01 08	010541 030021	76S 76S	77S 77S	66S 66S	54S 54S	41S 41S	27S 27S	14S 14S	0 N	12N 12N	25N 26N	39N 39N	52N 52N
5812 5813	9 10	2	W	113E 84E	01 08 01 08	045503 064948	77S 77S	77S 76S	66S	54S 53S	40S 40S	27S 27S	14S 13S	ON ON	12N 13N	26N	39N 39N	52N 52N
5814	11	2	F	56E	01 08	084437	77S	76S	65S	53S	40S	268	138	ON	13N	27N	40N	53N
5815 5816	12 1	5	F F	27E 2W	01 08 01 08	103929 123423	77S 78S	76S 75S	65S 64S	52S 51S	39S 38S	25S 25S	12S 11S	1 N 1 N	14N 15N	27N 28N	41N 41N	54N 54N
5817	2	2	F,	30M	01 08	142901	785	75S	648	528	388	25\$	128	1 N	14N	28N	41N	54N
5818 5819	3 4	5	W F	59W 88W	01 08 01 08	162323 181748	77S 77S	76S 76S	65S 66S	52S 53S	39S 40S	26S 26S	12S 13S	0 N	13N 13N	27N 26N	40N 39N	53N 52N
5820 5821	5 6	2	F F	116W 146W	01 08 01 08	201216 220646	77S 77S	76S 78S	66S 68S	54S 55S	40S 42S	27S 28S	14S 15S	0N 2S	12N 12N	26N 25N	39N 38N	52N 51N
5822	7	2	W	174W	01 09	000126	76S	77S	665	54S	41S	27S	148	ON	12N	25N	39N	52N
5823 5824	8 9	2	W	158E 129E	01 09 01 09	015603 035043	76S 76S	77S 77S	66S	54S 54S	41S 41S	27S 27S	14S 14S	ON ON	12N 12N	25N 25N	39N 39N	52N 52N
5825 5826	10 11	2	W	100E 72E	01 09 01 09	054526 074012	77S 77S	77S 76S	66S	54S 53S	40S 40S	27S 27S	14S 13S	ON ON	12N 13N	26N	NEC Nec	52N 52N
5827	12	2	F	43E	01 09	093502	77S	76S	658	538	398	268	138	ON	13N	27N	40N	53N
5828 5829	13 1	2	F F	14E 14W	01 09 01 09	112955 132450	77S 78S	76S 75S	65S 64S	52S 51S	39S 38S	25S 24S	12S 11S	1 N 2 N	14N 15N	28N 28N	41N 42N	54N 55N
5830	2	2	W	43W	01 09	151929	785	75S	648	518	388	25S	118	1 N	14N	28N	41N	54N
5831 5832	3 4	5	F F	72W 100W	01 09 01 09	171353 190820	77S 77S	76S 76S	65S 65S	52S 53S	39S 39S	26S 26S	12S 13S	0 N	14N 13N	27N 27N	40N 40N	53N 53N
5833 5834	5 6	2	F	129W 158W	01 09 01 09	210250 225723	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 27S	13S 13S	ON ON	13N 13N	26N	39N 39N	52N 52N
5835	7	2	W	174E	01 10	005203	77S	76S	668	538	40S	278	138	ON	13N	26N	39N	52N
5836 5837	8 9	5	W	145E 116E	01 10 01 10	024642 044125	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 26S	13S 13S	ON ON	13N 13N	26N 26N	39N 40N	52N 53N
5838 5839	10 11	2	W F	88E 59E	01 10 01 10	063610 083059	77S 77S	76S 76S	65S 65S	53S 52S	39S 39S	26S 25S	13S 12S	ON ON	13N 14N	27N 27N	40N 40N	53N 53N
5840	12	2	F	30E	01 !0	102551	785	75S	648	518	388	25\$	115	1 N	15N	28N	41N	54N
3359 5841	11 13	2	F F	58E 2E	01 10 01 10	120310 122045	7S 78S	5N 75S	18N 63S	32N 51S	45N 37S	58N 24S	105	2N	15N	29N	42N	55N
3360	12	2	F	30E	01 10	135635	88	4 N	18N	31N	44N	57N 24S	118	2N	15N	28N	41N	54N
5842 5843	1 2	2	F W	27W 56W	01 10 01 10	141524 160945	78S 78S	75S 75S	64S 64S	51S 52S	38 S 39S	258	128	2N 1 N	14N	27N	41N	53N
5844 5845	3 4	5	F F	84W 113W	01 10 01 10	180410 195838	77S 77S	76S 76S	65S 66S	52S 53S	39S 40S	26S 26S	12S 13S	ON ON	13N 13N	27N 26N	40N 39N	53N 52N
5846	5	2	F	142W	01 10	215309	77S	76S	668	538	40S	275	135	ON	13N	26N	39N	52N
584 7 5848	6 7	5	W	170W 161E	01 10 01 11	234747 014224	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 27S	13S 13S	ON ON	13N 12N	26N	39N 39N	52N 52N
5849 5850	8 9	2	W	132E 104E	01 11 01 11	033705 053149	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 26S	13S 13S	ON ON	13N 13N	26N	39N 40N	52N 53N
5851	10	5	W	75E	01 11	072636	77S	76S	65S	538	395	265	128	ON	13N	27N	40N	53N
5852 5853	11 12	2	F F	46E 18E	01 11 01 11	092127 111620	77S 78S	75S 75S	65S 64S	52S 51S	39S 38S	25S 25S	12S 11S	1 N 1 N	14N 15N	27N 28N	41N 41N	54N 54N
5854	1	5	F	11W	01 11	131116	785	74S	638	50S	378	24S 24S	10S 11S	2N	16N 15N	29N Nes	42N 42N	55N 55N
5855 5856	2 3	2	F W	40W 68W	01 11 01 11	150555 170016	78S 78S	74S 75S	63S 64S	51S 51S	37S 38S	258	118	2N 1N	14N	28N	41N	54N
585 <i>7</i> 5858	4 5	5 5 5	F F	97W 126W	01 11 01 11	185441 204909	77S 77S	76S 76S	65S 65S	52S 53S	39S 39S	26S 26S	12S 13S	ON ON	14N 13N	27N 26N	40N 40N	53N 53N
5859	6	2	F	154W	01 11	224340	77S	76S	668	538	40S	268	138	ON	13N	26N	39N	52N
5860 5861	7 8	5	W	177E 148E	01 12 01 12	003814 023251	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 27S	13S 13S	ON ON	13N 13N	26N	39N	52N 52N
5862 5863	9 10	2	W	120E 91E	01 12 01 12	042731 062214	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 26S	13S 13S	ON ON	13N 13N	26N	39N 40N	52N 52N
5864	11	5	F	62E	01 12	081700	77S	768	658	538	398	268	138	ON	13N	27N	40N	53N
58 6 5 58 6 6	12 13	2	F F	34E 5E	01 12 01 12	101149 120641	77S 78S	76S 75S	65S 64S	52S 51S	39S 38S	25S 25S	12S 11S	1 N 1 N	14N 15N	27N 28N	40N 41N	53N 54N
5867 5868	1	2	FW	23W 52W	01 12	140118 155540	78S 77S	75S 76S	64S 65S	52S 52S	38S 39S	25S 26S	12S 13S	1 N O N	14N 13N	27N 27N	4 O N 4 O N	53N 53N
5869	2	5	F	81W	01 12	175005	77S	76S	665	538	405	275	138	ON	13N	26N	39N	52N

PASS	TRACK	С	S	ALON	MO	DA	HRMNSE	LAT	LAT	SU8-	SATEL	LITE LAT	POINT LAT	PIC1 LAT	TURE L	OCATI	ON	LAT	LAT
5870	4	2	F	109W	01		194432	778	77S	668	548	418	275	145	ON	12N	25N	39N	51N
5871 5872	5 6	5	F W	138W 168W	01 01		213903 233339	76S 77S	77S 77S	67S 67S	54S 54S	41S 41S	28S 28S	14S 14S	1S 1S	12N 12N	25N 25N	38N	51N 51N
5873	7	2	W	165E	01	13	012816	76S	77S	67S	548	415	285	145	15	11N	25N	381	51N
5874 5875	8 9	5	W	136E 107E	01 01		032256 051739	76S 76S	77S 77S	67S 67S	54S 54S	41S 41S	28S 27S	14S 14S	1S 1S	12N 12N	25N 25N	38N 38N	51N 51N
5876 5877	10 11	2	W F	79E 50E	01 01		071225 090715	77S 77S	76S 76S	66S 66S	54S 53S	40S 40S	27S 26S	14S 13S	ON ON	12N 13N	26N	39N 39N	52N 52N
5878	12	2	F	21E	01	13	110207	778	768	65S	52\$	398	268	128	ON	14N	27N	40N	53N
5879 5880	1 2	2	F F	7W 36W	0 1 0 1		125703 145143	78S 78S	75S 75S	64S 64S	51S 52S	38S 38S	25S 25S	11S 12S	1 N 1 N	15N 14N	28N 27N	41N 41N	54N 53N
5881	3	2	W	65W	01	13	164607	77S	768	65S	528	398	268	128	ON	13N	27N	40N	53N
5882 5883	4 5	2	F F	WSS1	01 01		184034 203504	77S 77S	76S 76S	65S 66S	53S 53S	40S 40S	26S 27S	13S 13S	ИО ИО	13N 12N	26N	39N 39N	52N 52N
5884 5885	6 7	5	F W	151W 179W	01 01	13 14	222937 002413	77S 77S	76S 77S	66S 66S	54S 54S	40S 41S	27S 27S	14S 14S	ON ON	12N 12N	25N 25N	39N 39N	52N 52N
5886	8	2	W	152E	01	14	021852	77S	77S	66S	54S	415	275	145	ON	12N	25N	39N	52N
5887 5888	9 10	5	W	123E 95E	01 01		041334 060819	77S 77S	76S 76S	66S	53S 53S	40S 40S	27S 27S	14S 13S	0N 0N	12N 13N	26N	39N 39N	52N 52N
5889 5890	11 12	5	F F	66E 37E		14 14	080308 095759	77S 77S	76S 76S	65S 65S	53S 52S	39S 39S	26S 25S	13S 12S	ON 1 N	13N 14N	27N 27N	40N 40N	53N 53N
5891	13	2	F	9E	01	14	115254	785	758	648	518	388	258	118	1 N	15N	28N	41N	54N
5892 5893	1	5	F W	20W 49W	01 01	14	134752 154232	78S 78S	74S 74S	63S 63S	50S 50S	37S 37S	24S 24S	10S 10S	SN 8	16N 15N	29N 29N	42N 42N	55N 55N
5894 5895	3 4	5	F F	77W 106W	01 01	14 14	173654 193120	78S 77S	75S 75S	64S 64S	51S 52S	38S 39S	25S 25S	11S 12S	1N ON	14N 14N	28N 27N	41N 40N	54N 53N
5896	5	2	F	135W	01	14	212549	77S	768	658	528	398	268	128	ОИ	13N	2 7 N	40N	53N
5897 5898	6 7	5	W	163W 168E		14 15	232021 011456	77S 77S	76S 76S	65S 65S	53S 53S	39S 40S	26S 26S	13S 13S	ON ON	13N 13N	26N	40N 39N	53N 52N
5899 5900	8	5	W W	139E 111E	01 01	15	030934 050415	77S 77S	768	65S	538	40S	268	138	ON	13N 13N	26N	39N	52N
5901	10	2	W	82E	01	15	065900	77S	76S 76S	65S 65S	53\$ 52\$	40S 39S	26S 26S	13S 12S	0И ИО	13N	27N	40N 40N	53N 53N
5902 5903	11 12	2	F F	53E 25E		15 15	085347 104838	77S 78S	75S 75S	65S 64S	52S 51S	39S 38S	25S 25S	12S 11S	1 N 1 N	14N 15N	27N 28N	40N 41N	53N 54N
5904	1	2	F	4W	01	15	124331	785	75 S	638	528	388	25\$	128	SN	15N	28N	42N	55N
5905 5906	2	5	F W	33W 61W	01 01	15	143810 163232	78S 78S	75S 75S	63S 64S	52S 52S	39S 38S	25S 25S	12S 12S	2N 1N	15N 14N	28N 27N	41N 40N	54N 53N
5907 5908	4 5	5	F F	90W 119W	01 01	15 15	182658 202127	77S 77S	76S 76S	65S 65S	52S 53S	39S 40S	26S 26S	12S 13S	ON ON	13N 13N	27N 26N	40N 39N	53N 52N
5909	6	2	F	147W	01	15	221559	77S	768	66S	538	40S	278	138	ON	13N	26N	39N	52N
5910 5911	7 8	5	W	176W 155E		16 16	001033 020511	77S 77S	76S 76S	66S 66S	53S 53S	40S 40S	27S 27S	13S 13S	0N 0N	12N 13N	26N	39N 39N	52N 52N
5912 5913	9 10	5	W	127E 98E	01 01	16 16	035952 055437	77S 77S	76S 76S	66S 65S	53S 53S	40S 40S	27S 26S	13S 13S	ИО ИО	13N 13N	26N	39N 40N	52N 52N
5914	11	2	W	69E	01	16	074924	77S	768	658	528	398	268	128	ON	1 3N	27N	4 O N	53N
5915 5916	12 13	5	F F	41E 12E		16 16	094415 113908	77S 78S	75S 75S	64S 64S	52S 51S	39S 38S	25S 24S	12S 11S	1 N 2 N	14N 15N	27N 28N	41N 41N	54N 54N
5917 5918	1 2	5	F F	17W 45W	01 01	16 16	133346 152808	78S 77S	75S 75S	64S 65S	51S 52S	38S 39S	25S 26S	11S 12S	1 N ON	14N 14N	28N 27N	41N 40N	54N 53N
5919	3	2	F	74W	01	16	172232	77S	768	65S	538	40S	268	138	ON	1 3N	26N	39N	52N
5920 5921	4 5	5	F F	103W 131W	01 01		191700 211131	77S 77S	76S 76S	66S	53S 54S	40S 41S	27S 27S	13S 14S	ON ON	12N 12N	26N 25N	39N 38N	52N 51N
5922 5923	6 7	2	F W	160W 171E	01 01		230605 010045	76S 77S	77S 77S	66S 66S	54S 54S	41S 41S	27S 27S	14S 14S	1S 1S	12N 12N	25N 25N	38N	51N 51N
5924	8	2 2 2 2	W	143E	01	17	025525	778	778	668	548	418	275	148	ON	12N	25N	38N	51N
5925 5926	9 10	5	W	114E 85E	01 01		045009 064455	77S 77S	76S 76S	66S 66S	53S 53S	40S 40S	27S 27S	14S 13S	NO NO	12N 13N	26N	39N 39N	52N 52N
5927 5928	11 12	5	F F	57E 28E	01 01		083945 103438	77S 77S	76S 75S	65S 64S	52S 52S	39S 39S	26S 25S	13S 12S	ON 1N	13N 14N	27N 27N	40N 41N	53N 54N
5929	1	5	F	1 W	01	17	122933	785	75 S	648	518	388	248	118	2N	15N	28N	41N	54N
5930 5931	2	5 5 5 5	F W	29W 58W	01 01		142413 161837	78S 78S	75S 75S	64S 64S	51S 52S	38S 39S	25S 25S	11S 12S	1 N O N	14N 14N	28N 27N	41N 40N	54N 53N
5932 5933	4	2	F F	87W 115W	01 01		181303 200733	77S 77S	76S 76S	65S 65S	52S 53S	39S 40S	26S 26S	13S 13S	ON ON	13N 13N	26N	40N 39N	53N 52N
5934	5 6	2	F	144W	01	17	220206	778	76S	668	538	40S	275	138	ON	13N	26N	3 9 N	52N
5935 5936	7 8	5	W	173W 159E	01 01		235646 015125	77S 77S	76S 76S	66S 66S	53S 53S	40S 40S	27S 27S	13S 13S	ON ON	13N 13N	26N	39N 39N	52N 52N
5937 5938	9 10	2 2 2 2 2 2 2	W	130E 101E	01 01	18	034607 054052	77S 77S	76S 76S	65S 65S	53S 53S	40S 39S	26S 26S	13S 13S	ON ON	13N 13N	26N 27N	39N 40N	52N 53N
5939	11	2	W	73E	01	18	073540	77S	76S	65S	528	398	258	128	ON	14N	27N	4 O N	53N
5940 5941	12 13	5	F F	44E 15E	01 01		093031 112526	78S 78S	75S 75S	64S 63S	51S 51S	38S 37S	25S 24S	11S 11S	1 N 2 N	14N 15N	28N 29N	41N 42N	54N 55N
5942 5943	1 2	2	F F	13W 42W	01 01	18	132005 151426	78S 78S	75S 75S	63S 64S	51S 52S	38S 39S	24S 25S	11S 12S	1 N 1 N	15N 14N	28N 27N	41N 40N	54N 53N
5944	3	5	F	71W	01		170851	775	76S	655	52S	395	265	135	ON	13N	26N	40N	53N

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5945 5946 5947 5948 5949 5950 5951 5952	4 5 6 7 8 9 10	2 2 2 2 2 2 2 2	F F 5 3 3 3 5 F	99W 128W 157W 175E 146E 117E 89E 60E	01 18 01 18 01 18 01 19 01 19 01 19 01 19 01 19	190318 205749 225223 004700 024140 043624 063110 082559	LAT 77S 77S 77S 77S 77S 77S 77S	76S 76S 76S 76S 76S 76S 76S 76S	655 665 665 665 665 665 655	53S 53S 53S 54S 53S 53S 53S 53S 53S	40S 40S 40S 40S 40S 40S 40S 39S	26S 27S 27S 27S 27S 27S 27S 26S 26S	13S 13S 14S 14S 14S 13S 13S 13S	ON ON ON ON ON ON	13N 12N 12N 12N 12N 12N 12N 13N 13N	26N 26N 25N 25N 25N 25N 26N 26N 27N	29N 39N 39N 39N 39N 39N 39N 39N 40N	52N 52N 52N 52N 52N 52N 52N 52N 52N 52N
5953 5954 5955 5956 5957 5958 5959 5960	12 13 1 2 3 4 5 6	2 2 2 2 2 2 2 2	F F W F F F W	31E 3E 26W 55W 83W 112W 141W 169W	01 19 01 19 01 19 01 19 01 19 01 19 01 19 01 19	102052 121547 141027 160448 175913 195341 214811 234252	78S 78S 78S 78S 77S 77S 77S 77S	755 755 755 755 765 765 765 765	64S 64S 64S 64S 65S 66S 66S	52S 51S 51S 52S 52S 53S 53S 53S	38S 38S 38S 39S 39S 40S 40S 40S	25S 24S 24S 25S 26S 27S 27S 27S	12S 11S 11S 12S 13S 13S 14S 13S	1 N 2 N 1 N 0 N 0 N 0 N 0 N 0 N	14N 15N 15N 14N 13N 13N 12N 12N	28N 28N 28N 27N 26N 26N 25N 26N	41N 42N 41N 40N 39N 39N 39N 39N	54N 55N 54N 53N 52N 52N 52N 52N 52N
5961 5962 5963 5964 5965 5966 5967 5968 5969	7 8 9 10 11 12 1 2	22222222	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	162E 133E 105E 76E 47E 19E 10W 39W 67W	01 20 01 20 01 20 01 20 01 20 01 20 01 20 01 20 01 20	013729 033209 052652 072138 091628 111120 130558 150021 165447	77S 77S 77S 77S 77S 78S 78S 77S	76S 76S 76S 76S 76S 75S 75S 76S 76S	66S 66S 65S 65S 64S 64S 65S	53S 53S 53S 53S 52S 51S 52S 52S 52S 53S	40S 40S 39S 39S 38S 38S 38S 39S 40S	275 275 275 265 265 255 255 265 275	145 135 135 135 125 115 125 135	ON ON ON ON 1N 1N ON	12N 12N 13N 13N 14N 14N 14N 13N 12N	26N 26N 26N 26N 27N 28N 27N 26N 26N	39N 39N 39N 40N 40N 41N 40N 39N 39N	52N 52N 52N 52N 53N 54N 53N 52N 52N
5970 5971 5972 5973 5974 5975 5976 5977	4 5 6 7 8 9 10	2 2 2 2 2 2 2 2	F F V V V V F	96W 125W 153W 178E 149E 121E 92E 63E	01 20 01 20 01 20 01 21 01 21 01 21 01 21 01 21	184916 204348 223824 003302 022744 042229 061717 081208	77S 77S 76S 76S 77S 77S 77S 77S	76S 77S 77S 77S 77S 76S 76S 76S	66S 66S 66S 66S 66S 66S 66S	53S 54S 54S 54S 54S 53S 53S 52S	40S 41S 41S 41S 41S 40S 40S 39S	275 275 285 285 275 275 265 265	14S 14S 14S 14S 14S 14S 13S 12S	ON 1S 1S 1S 1S ON ON	12N 12N 12N 12N 12N 12N 13N 13N	25N 25N 25N 25N 25N 25N 26N 26N 27N	38N 38N 38N 38N 38N 38N 39N 39N 40N	51N 51N 51N 51N 51N 51N 52N 52N 52N 53N
5978 5979 5980 5981 5982 5983 5984 5985	12 13 1 2 3 4 5	2 2 2 2 2 2 2 2 2	FFVFFV	35E 6E 23W 51W 80W 109W 137W 166W	01 21 01 21 01 21 01 21 01 21 01 21 01 21	100703 120200 135641 155104 174530 193959 213431 232906	78S 78S 78S 78S 77S 77S 77S 77S	75S 75S 75S 75S 75S 76S 76S 76S	64S 63S 64S 65S 65S 65S	52S 51S 51S 51S 52S 53S 53S 53S	38S 37S 38S 38S 39S 39S 40S 40S	25S 24S 24S 25S 26S 26S 26S 27S	12S 11S 11S 12S 12S 13S 13S 13S	1 N 2 N 1 N 1 N 0 N 0 N 0 N	14N 15N 15N 14N 13N 13N 13N	28N 29N 28N 27N 27N 26N 26N 26N	41N 42N 41N 40N 40N 39N 39N 39N	54N 55N 54N 53N 53N 52N 52N 52N
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6068 6070 6071 6072 6073 6074 6075 6076 6076 6077 6080 3601 6081 6082 6083 6084 6085 6086 6087 6088 6089 6090 6090	PASS 6020 6021 60223 6024 6025 6026 6027 6028 6028 6029 6030 6031 6033 6034 6035 6036 6037 6041 6042 6044 6045 6046 6047 6048 6046 6047 6056 6057 6058 6056 6056 6066	PASS
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6799	42W 03 26 71W 03 27 71W 03 27 71W 146E 03 27 71W 146E 03 27 71W 146E 03 27 71W 146E 03 27 71W 17E 03 28	164801 76S 184228 76S 203658 77S 223131 77S 002606 77S 022045 77S 041527 77S 061012 77S 080500 77S 095951 77S 115445 75S 134922 76S 154343 76S 173808 77S	63S 51S 51S 51S 51S 51S 51S 51S 51S 51S 51	38S 25S 39S 26S 39S 26S 27S 40S 27S 40S 27S 40S 27S 40S 27S 40S 27S 40S 28S 40S 28S 40S 28S 42S 29S 42S 28S 44S 28S 28S 28S 28S 28S 28S 28S 28S 28S 28	115 1N	14N 28N 14N 27N 13N 26N 12N 26N 12N 25N 12N 26N 12N 26N 12N 26N 12N 26N 12N 26N 12N 26N 11N 24N 11N 25N 12N 26N 12N 26N 12N 26N 12N 26N 12N 26N 12N 26N 11N 24N 11N 24N 11N 24N 11N 24N 11N 24N 11N 24N 11N 26N 12N 24N 11N 23N 11N 24N 11N 23N 11N 24N 11N 23N 11N 23	41N 54N 67N 40N 54N 66N 40N 53N 65N 39N 52N 65N 39N 52N 64N 39N 52N 64N 39N 52N 65N 39N 53N 65N 39N 53N 65N 39N 53N 65N 39N 51N 64N 37N 50N 63N

PASS	TRACK	С	S	ALON	MO DA	HRMNSE			SUB-	SATEL	LITE	POINT	PICT	URE L	OCAT I	ON		
							LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT	LAT
6838	5	2	F	141W	03 29	212706	785	685	558	438	30S	17S	45	911	2311	3611	49N	6311
6839	6	2		170W	03 30	232100	78S	688	558	438	30S	17S	48	911	2311	3611	49N	63N
6840	7	2		162E	03 30	011600	78S	685	54S	43S	308	17S	38	1 ON	1122	3611	49N	6311
6841	8	2		131E	03 30	031000	785	688	54S	43S	30S	17S	48	101	1122	3611	49N	6311
6842	9	2		105E	03 30	050500	78S	688	55S	43S	30S	17S	38	1 O N	2311	3611	49N	6311
6843	10	2		57E	03 30	065900	785	688	55S	43S	298	168	38	1 ON	115.5	36N	4911	6311
6844	11	2		47E	03 30	085300	77S	67S	55S	43S	285	15S	4 S	1 O N	2311	3711	102	6311
6845	12	2		18E	03 30	104800	77S	67S	54S	41S	285	15S	38	1111	2411	3711	51N	64N
6846	1	2		8W	03 30	124300	76S	668	538	41S	285	15S	28	121	2511	1186	115	6411
6847	2	2		39W	03 30	143800	77S	668	548	41S	285	15S	2S	11N	24N	3811	5211	6411
6848	3	2		68W	03 30	163900	77S	67S	55S	42S	298	168	38	101	241	371	501	63N
6849	4	2		97W	03 30	182700	78S	688	55S	43S	298	168	38	101	5311	3611	49N	63N
6850	5	2		125W	03 30	202100	78S	688	558	438	30S	17S	4 S	98	531	3611	491	62N
6851	6	2		149W	00 00	221600	78S	688	568	438	30S	17S	4S	911	2311	3611	491	63N
6852	7	2		177E	03 31	001000	78S	688	568	438	30S	17S	4S	911	1155	36N	49N	6311
6853	8	2		151E	03 31	020500	78S	688	568	438	30S	17S	4 S	116	1125	198	491	1159
6854	9	2		120E	03 31	040000	78S	688	568	438	30S	17S	4 S	911	1185	391	102	62N
6855	10	2		92E	03 31	055500	78S	688	568	438	30S	17S	4 S	911	5311	361	501	63N
6856	11	2		63E	03 31	074900	77S	67S	558	42S	298	168	38	101	2411	371	100	6411
6857	12	2		37E	03 31	094400	77S	67S	558	438	285	15S	4 S	101	2311	37N	102	63N
6858	13	2		5E	03 31	113800	77S	668	54S	41S	28S	15S	2S	111	2511	381	125	6411
6859	1	2		24\/	03 31	133300	77S	67S	54S	41S	285	15S	28	1111	2511	188	5111	64N
6860	2	2		52W	03 31	152800	77S	67S	558	42S	298	15S	38	101	24N	3611	102	63N
6861	3	2	F	77W	03 31	172355	76S	67S	54S	42S	285	15S	28	101	2411	371	102	6311
6862	4	2		109W	03 31	191700	78S	688	568	438	30S	17S	4 S	116	1155	361	4911	6211
6863	5	2		137W	03 31	211200	79S	698	568	44S	31S	18S	5S	118	1125	351	481	6211
6864	6	2		164W	03 31	230700	79S	698	568	44S	31S	188	5S	811	21N	3411	4811	611

TABLE 1
TRACK TABLE FOR ESSA 3

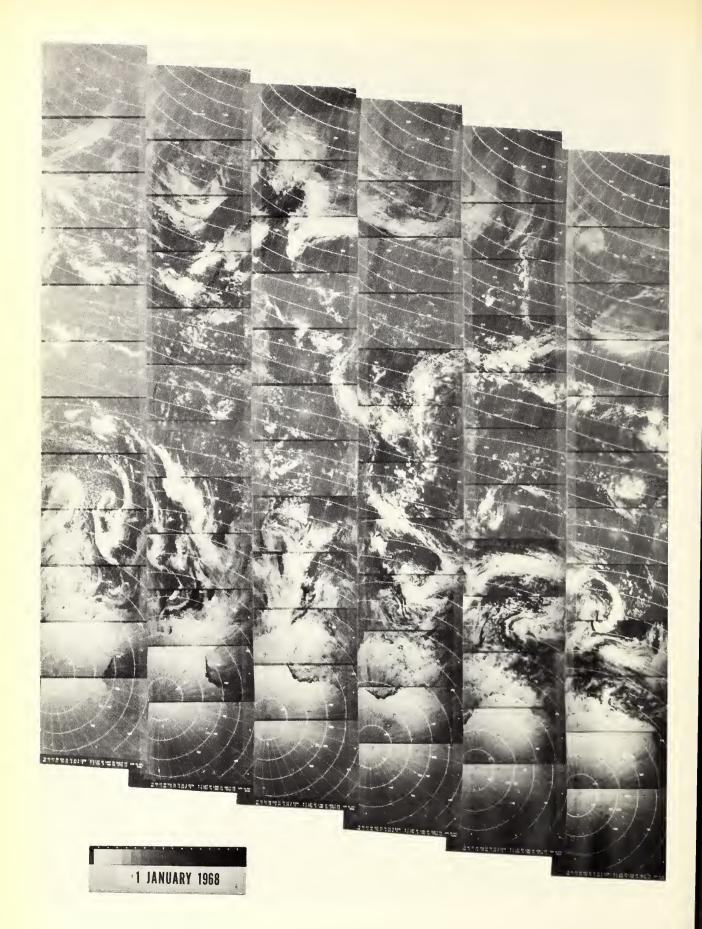
Range of Ascending Nodes	Track No
0 - 28.7W	1
28.7W - 57.4W	2
57.4W - 86.1W	3
86.1W - 114.8W	4
114.8W - 143.5W	5
143.5W - 172.2W	6
172.2W - 159.1E	7
159.1E - 130.4E	8
130.4E - 101.7E	9
101.7E - 73.0E	10
73.0E - 44.3E	11
44.3E - 15.6E	12
15.6E - 0	13

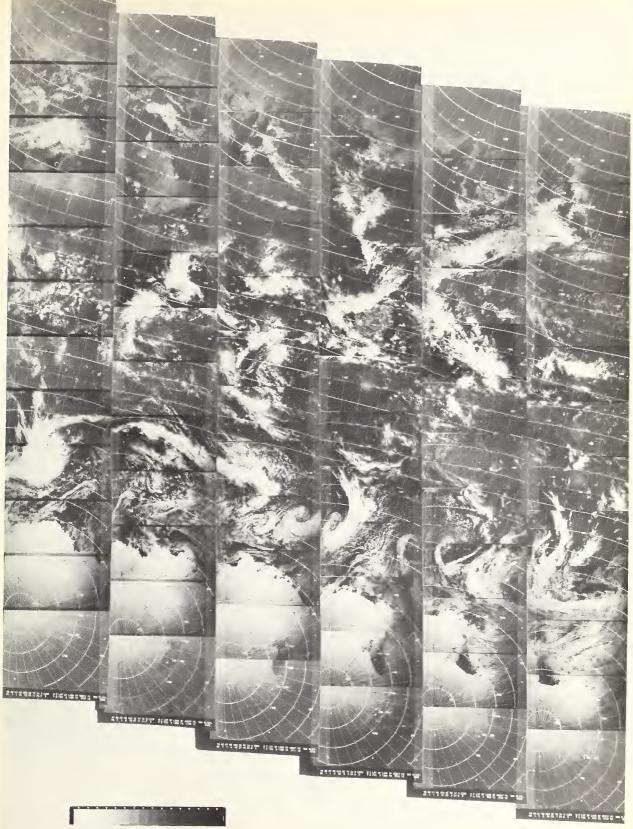
Difference between Tracks - 28.7°

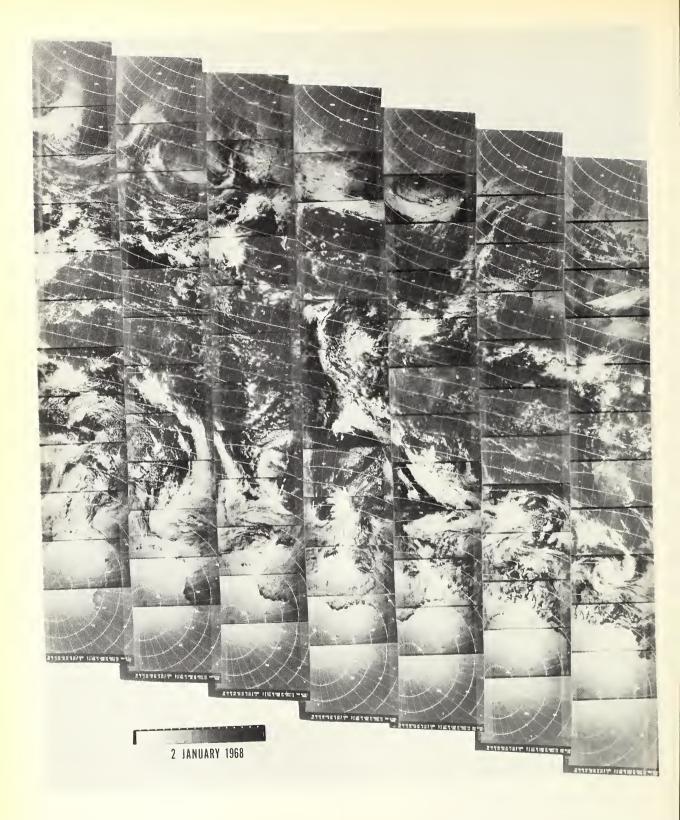
TABLE 2
TRACK TABLE FOR ESSA 5

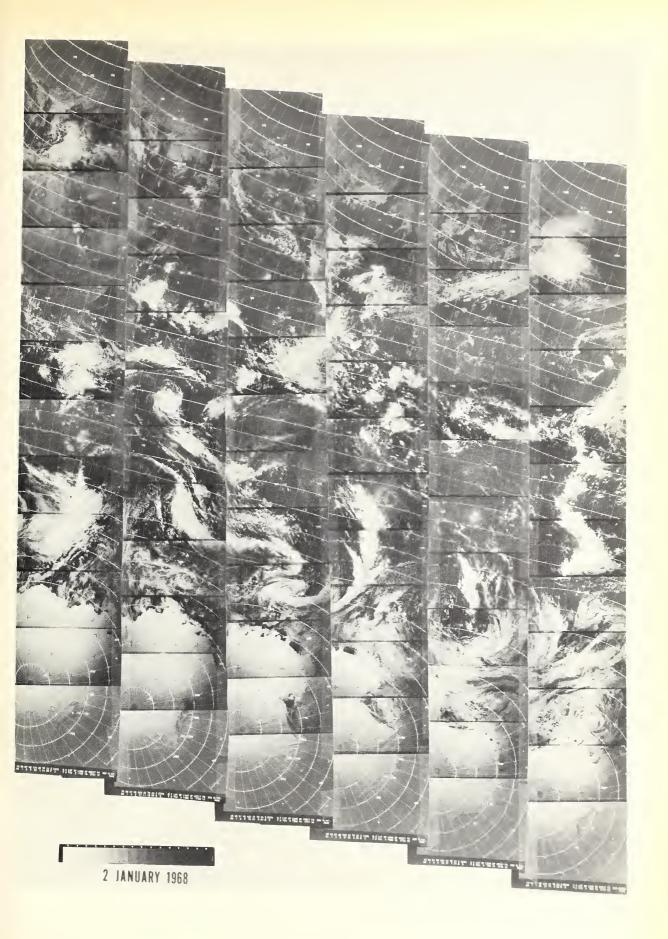
Range of A	s	ending	Nodes	Track	No
0	_	28.4W		1	
28.4W	-	56.8W		2	
56.8W	-	85.2W		3	
85.2W	-	113.6W		4	
113.6W	-	142.0W		5	
142.0W	-	170.4W		6	
170.4W	-	161.2E		7	
161.2E	-	132.8E		8	
132.8E	-	104.4E		9	
104.4E	-	76.0E		10	
76.0E	-	47.6E		11	
47.6E	-	19.2E		12	
19.2E	-	0		13	

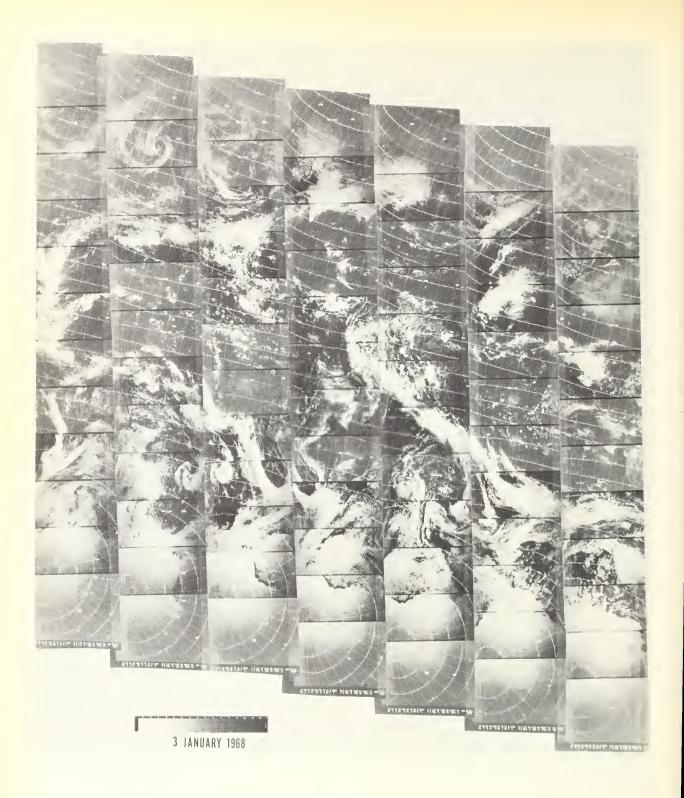
Difference between Tracks - 28.4°

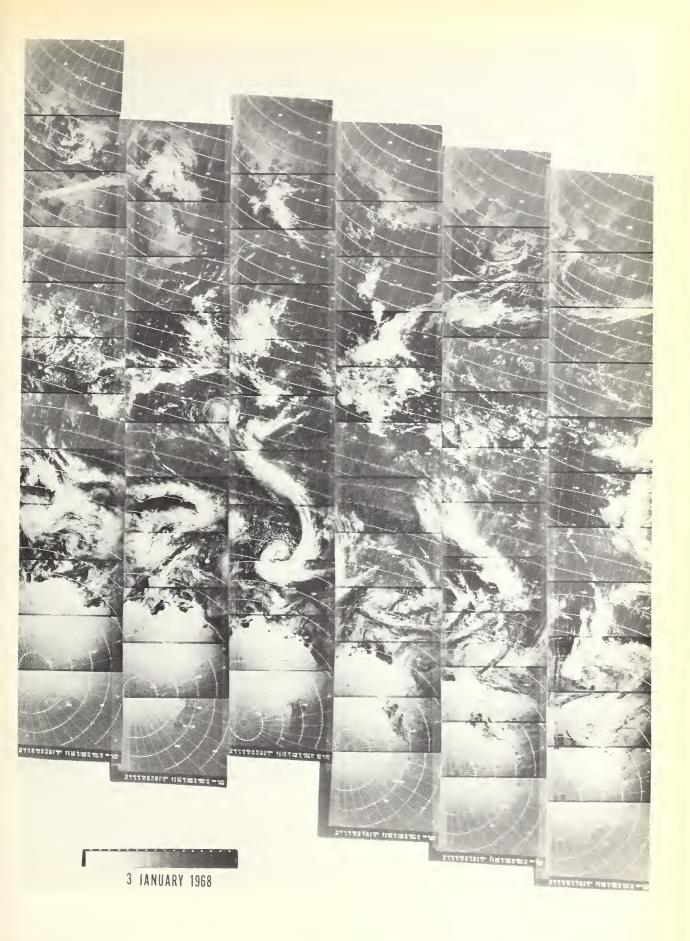


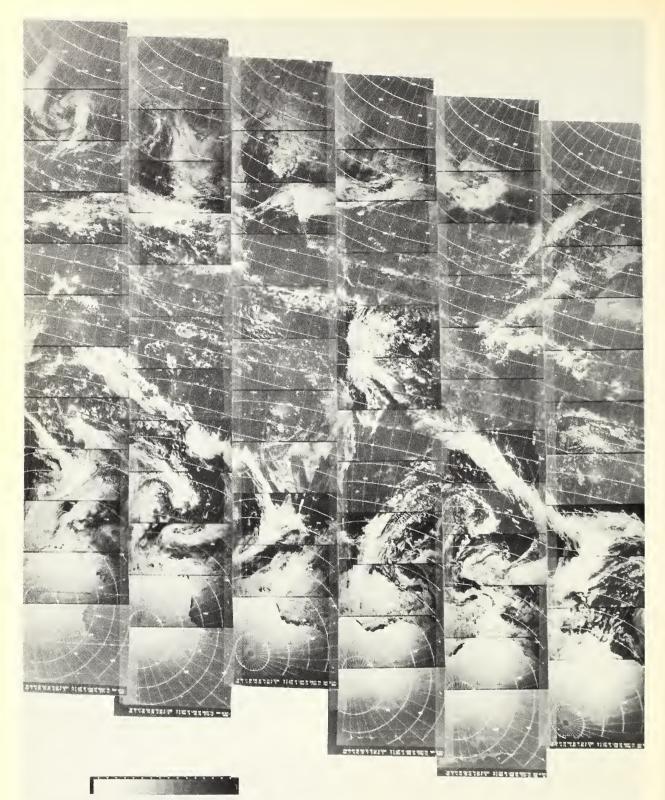




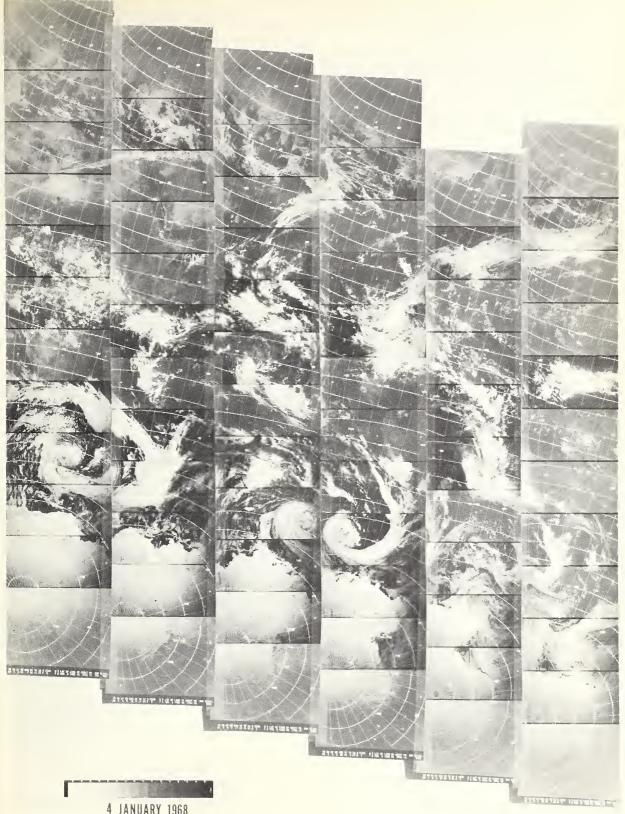




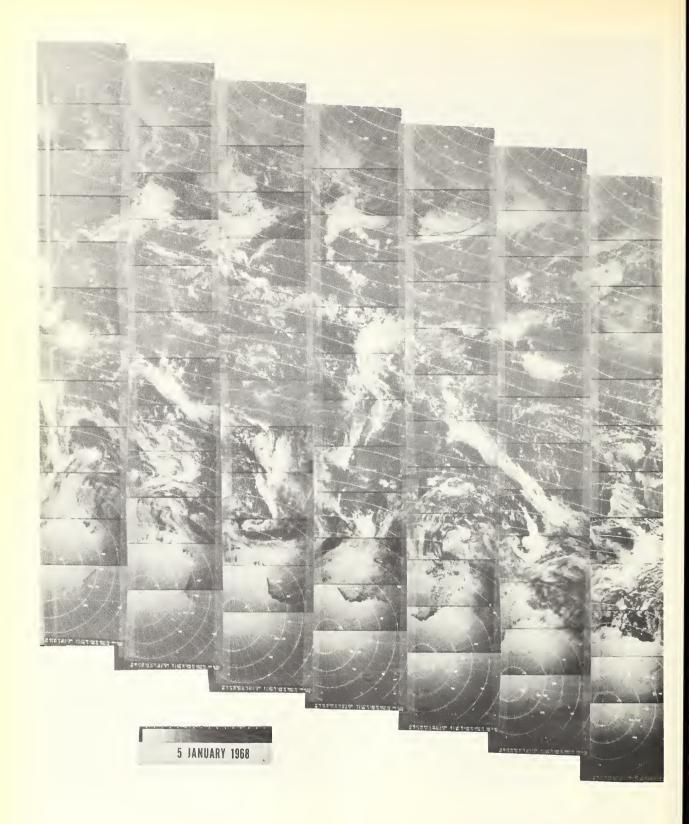


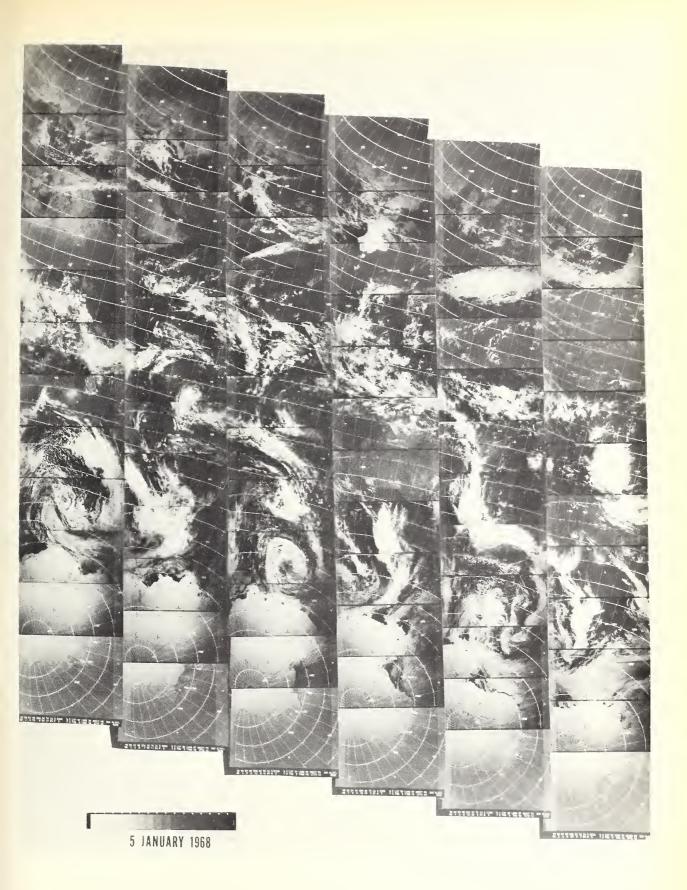


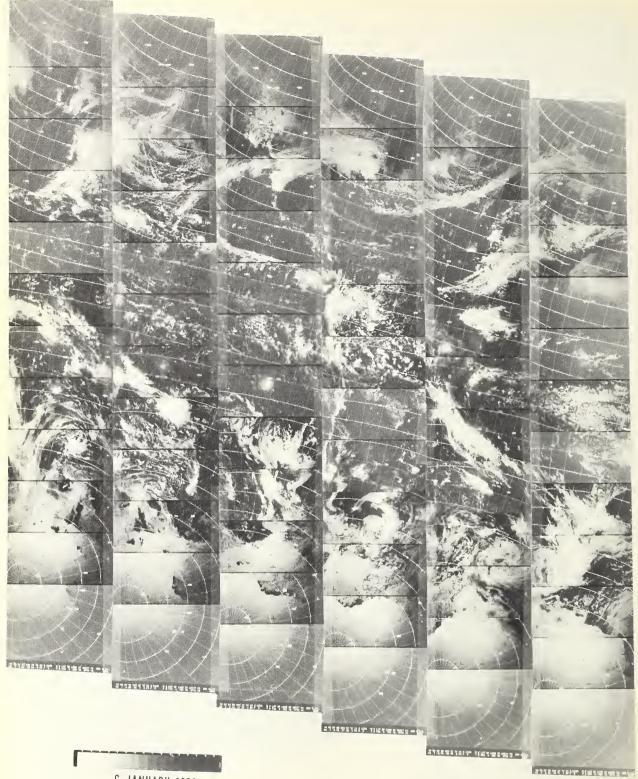
4 JANUARY 1968



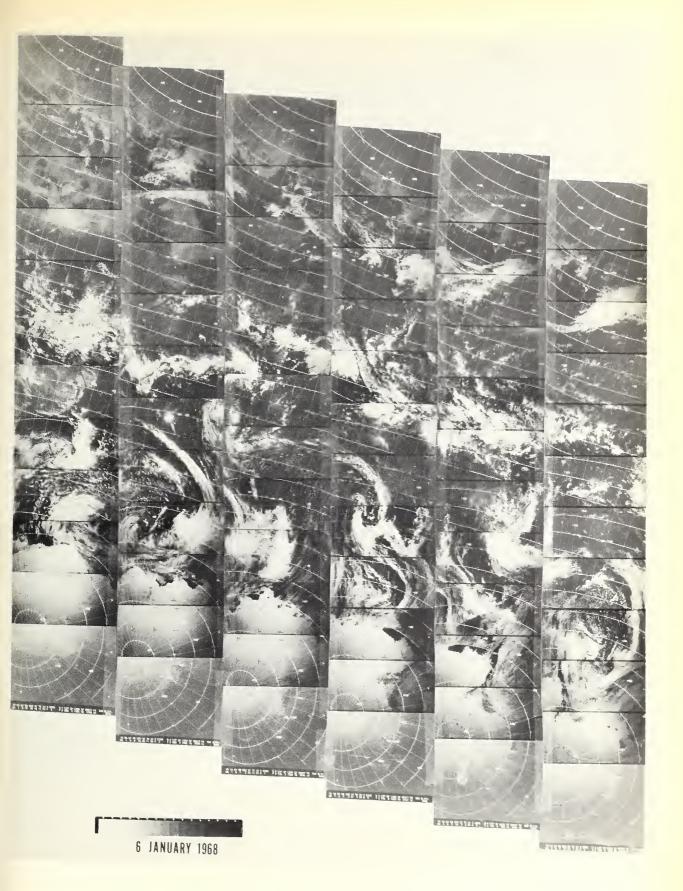
4 JANUARY 1968

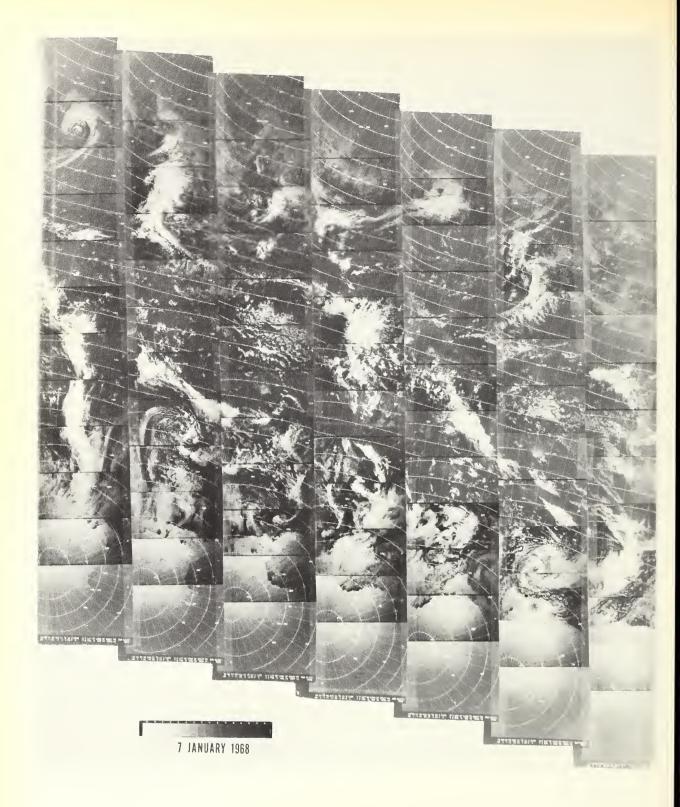


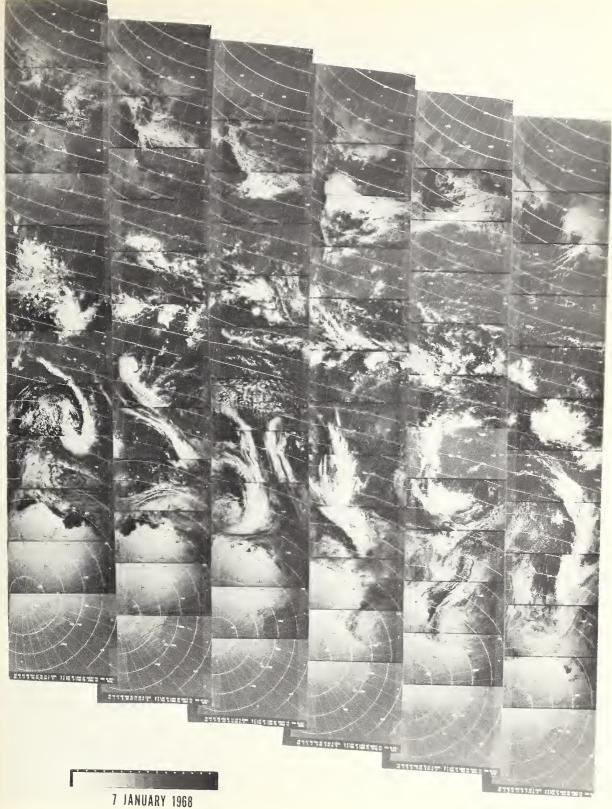


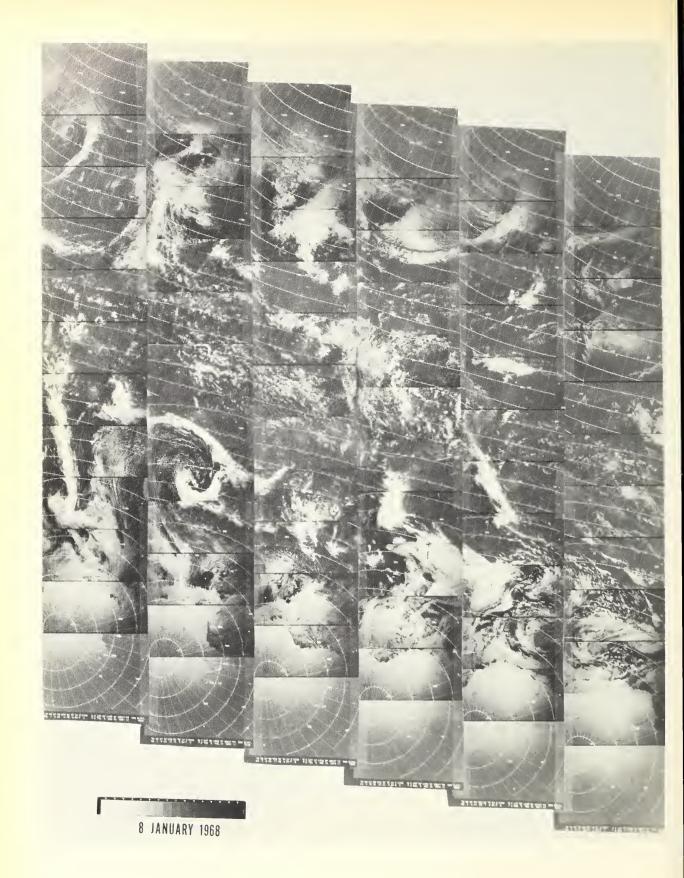


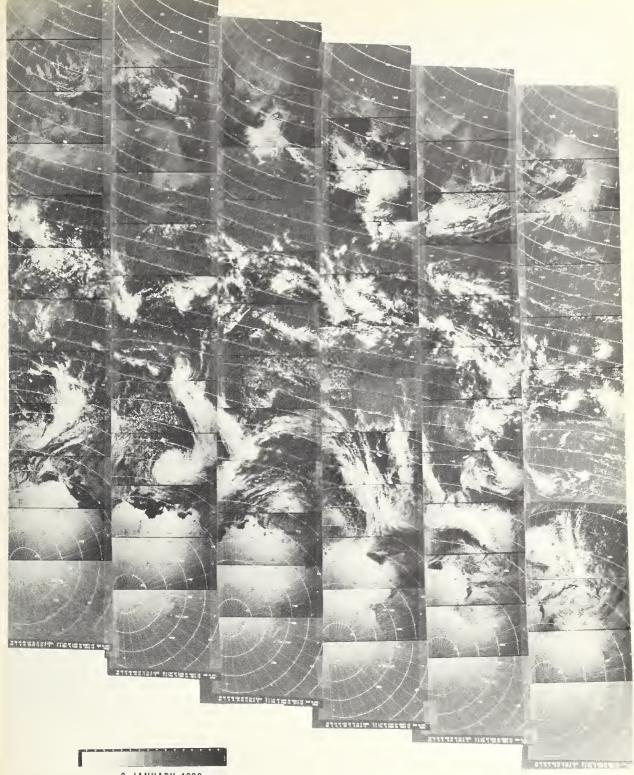
6 JANUARY 1968



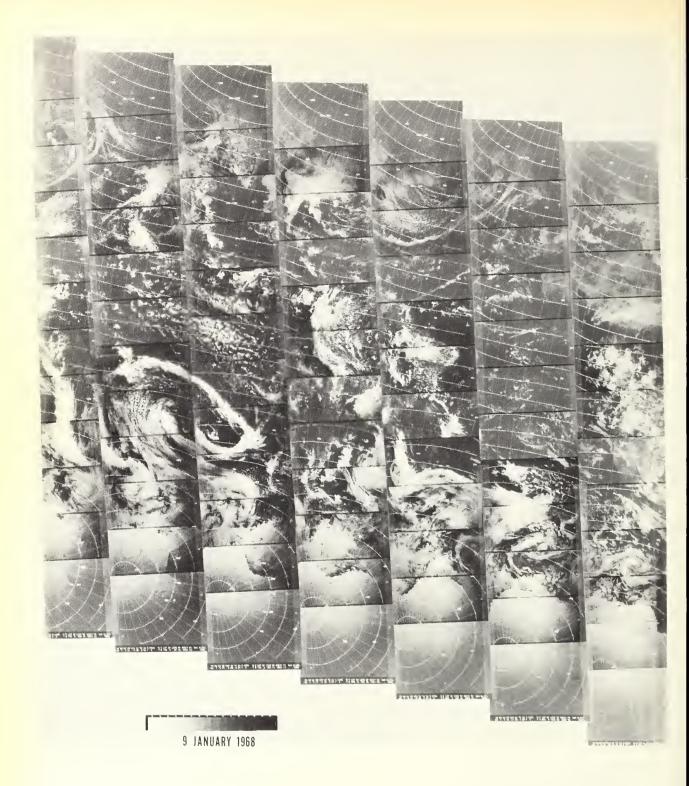


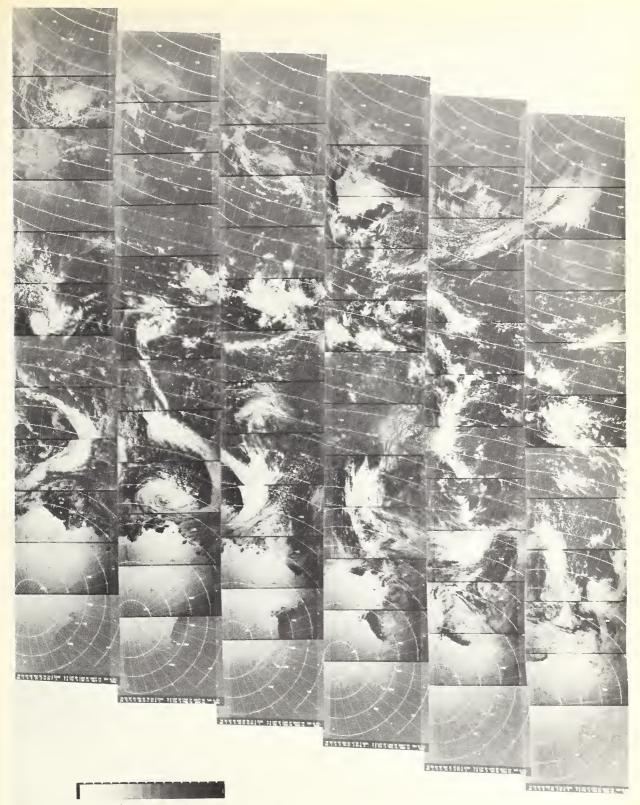




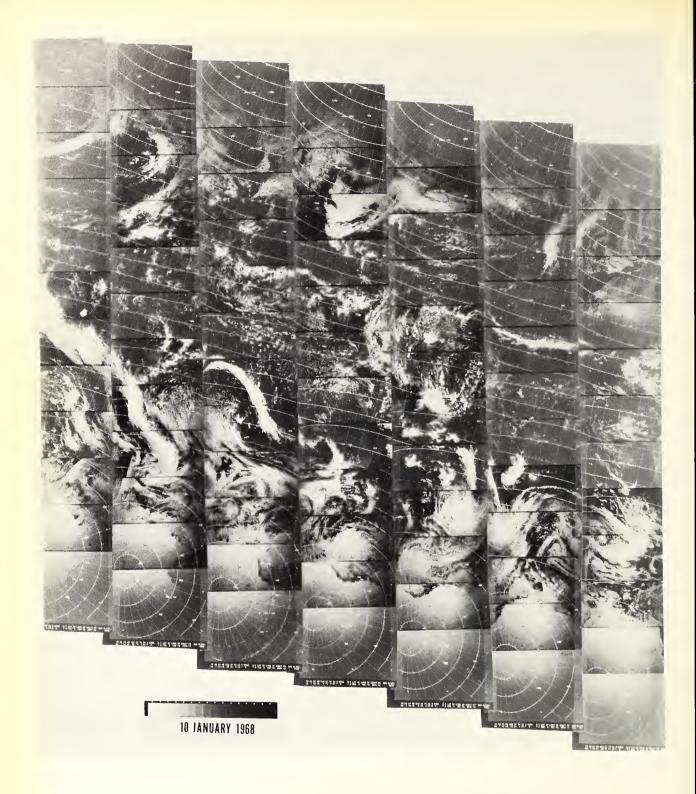


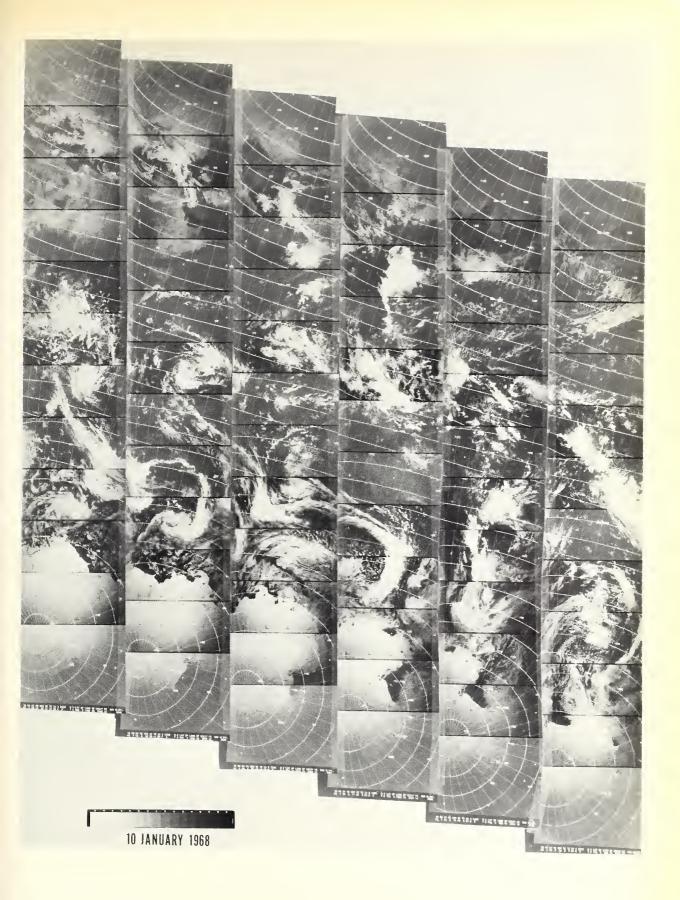
8 JANUARY 1968



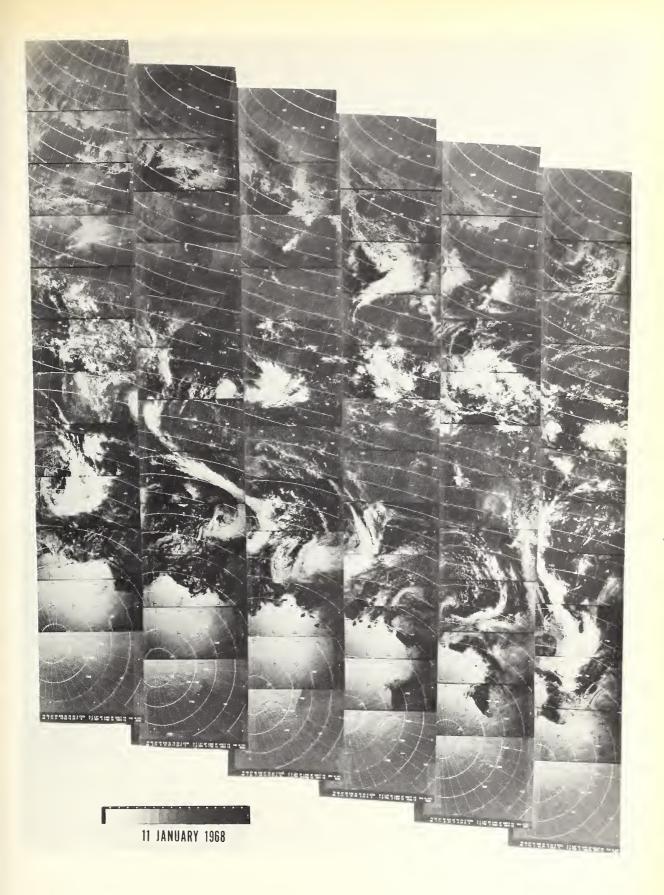


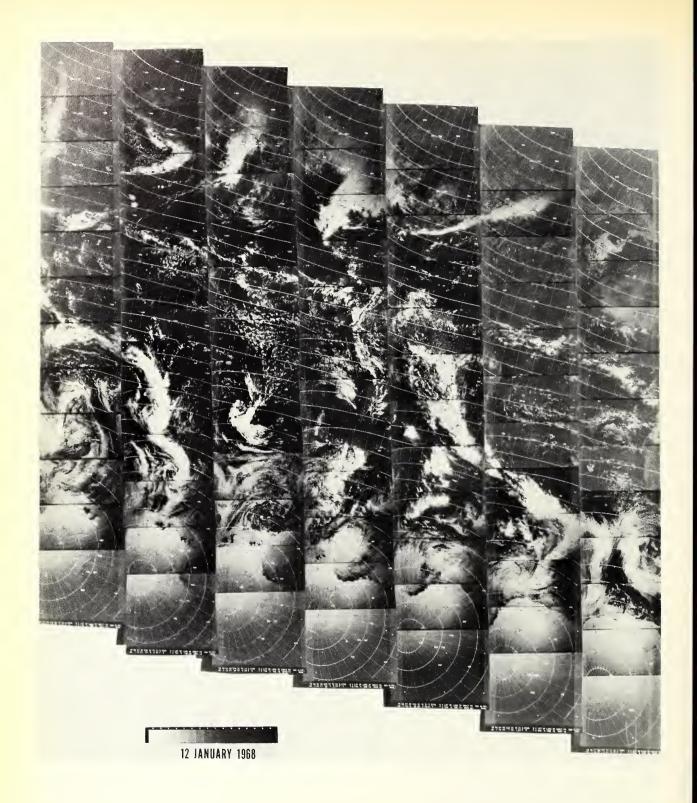
9 JANUARY 1968



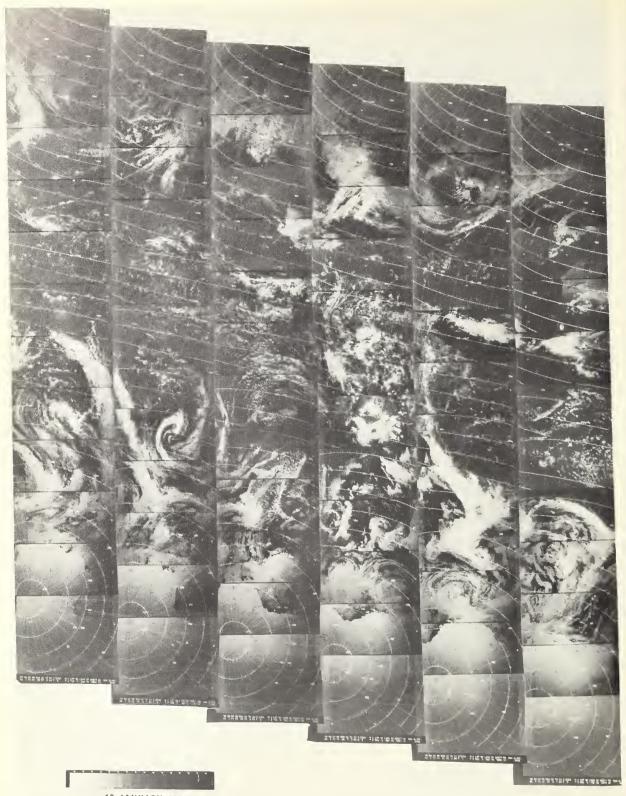




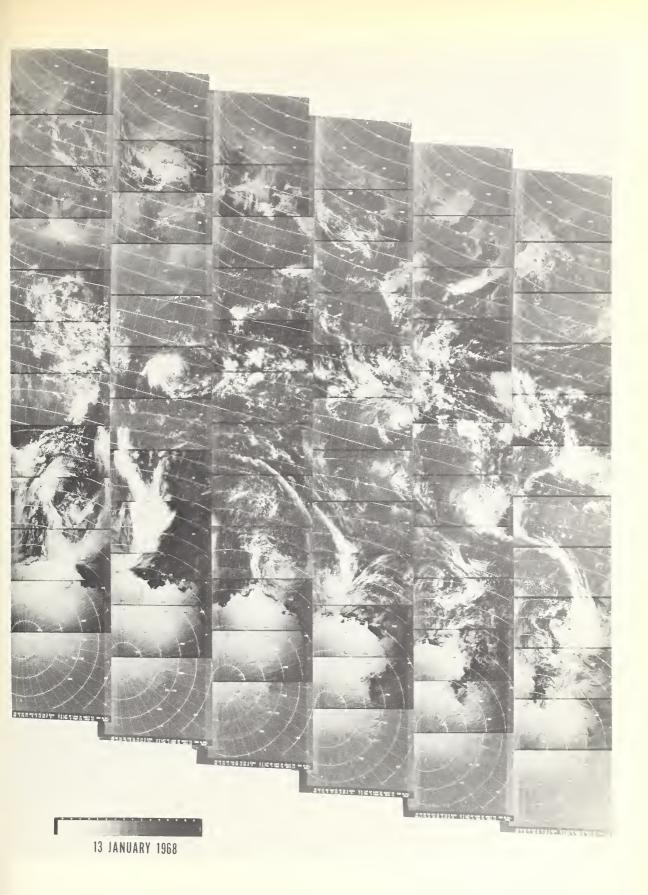


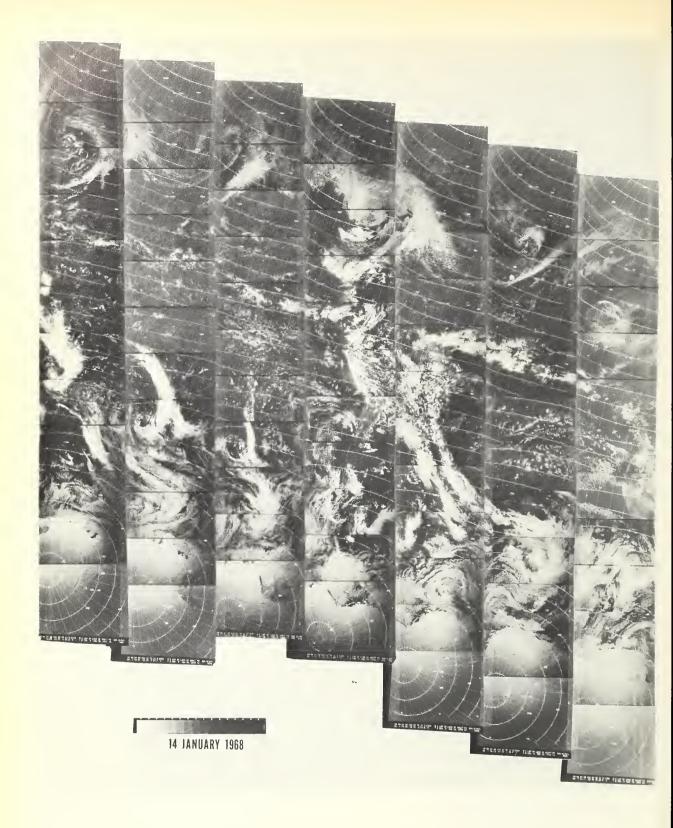


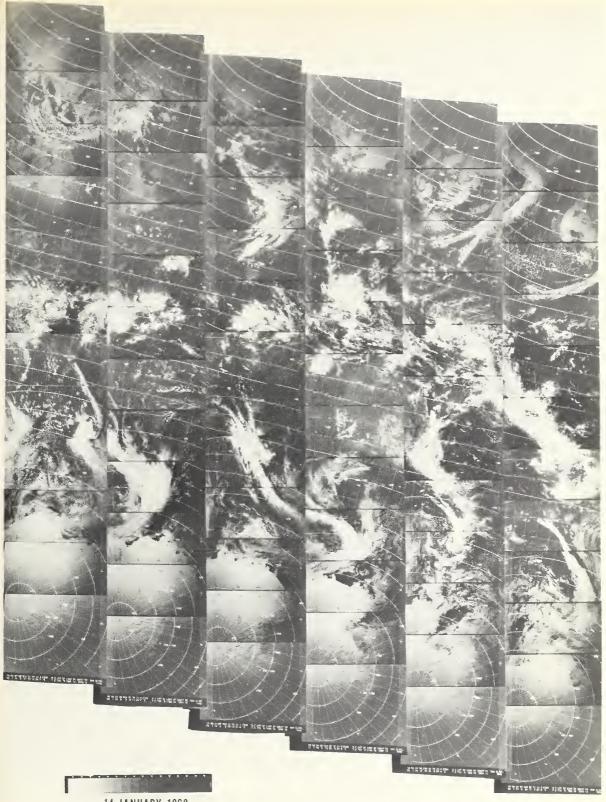




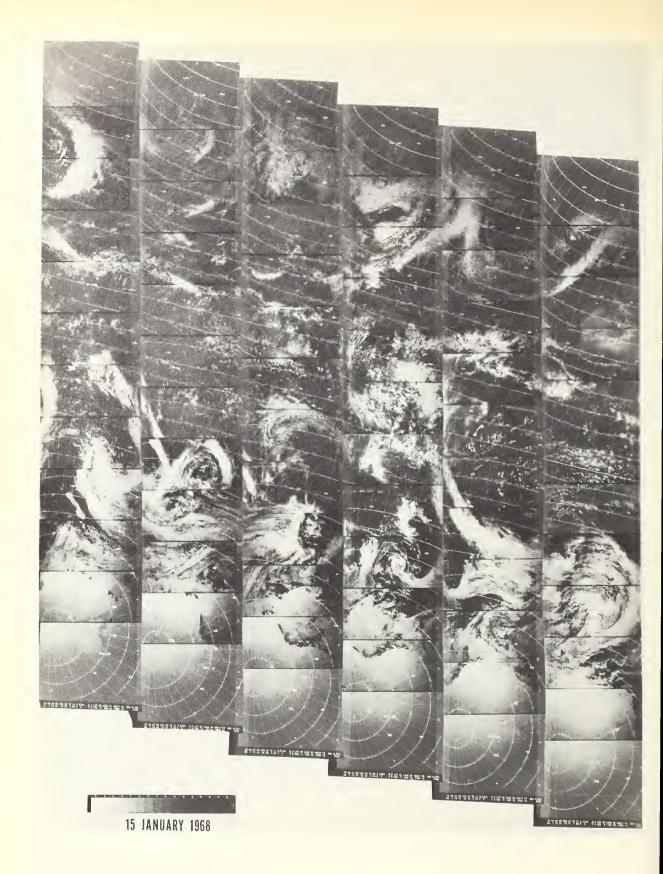
13 JANUARY 1968

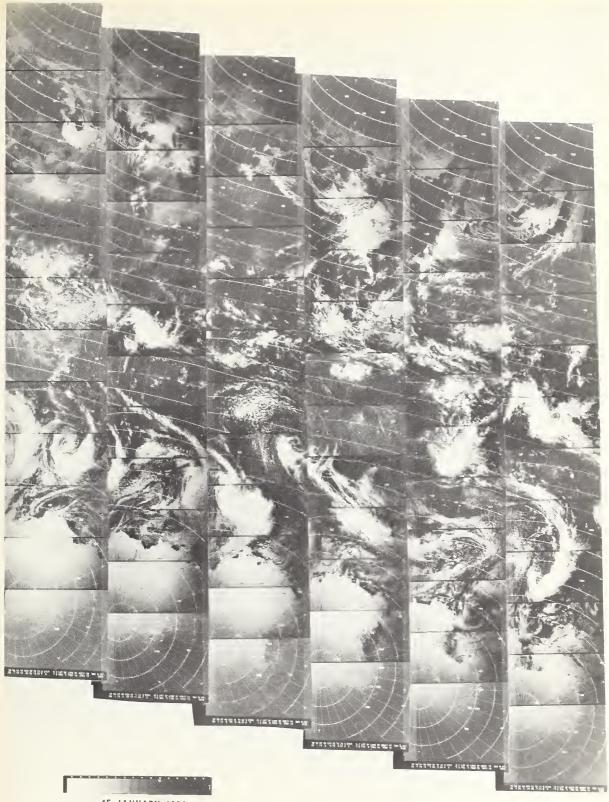




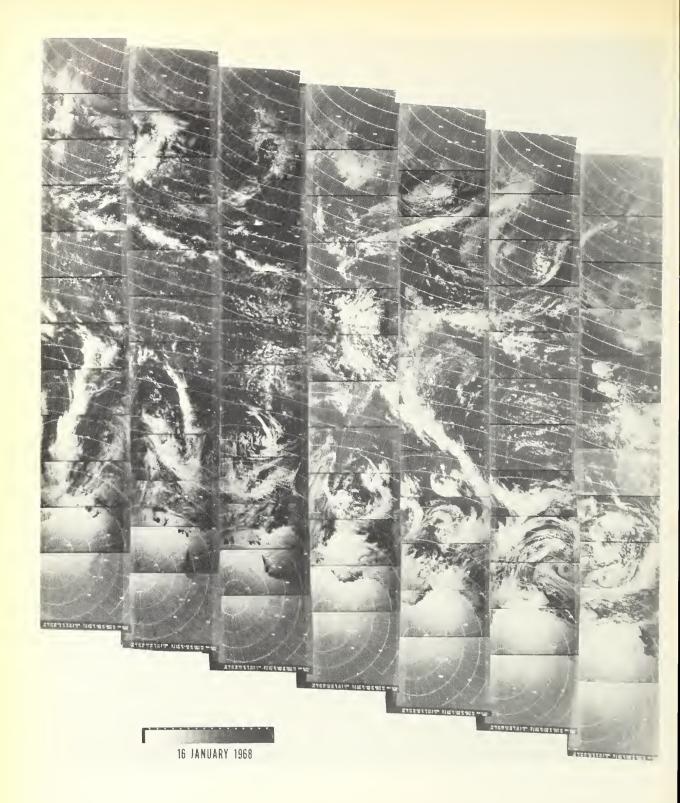


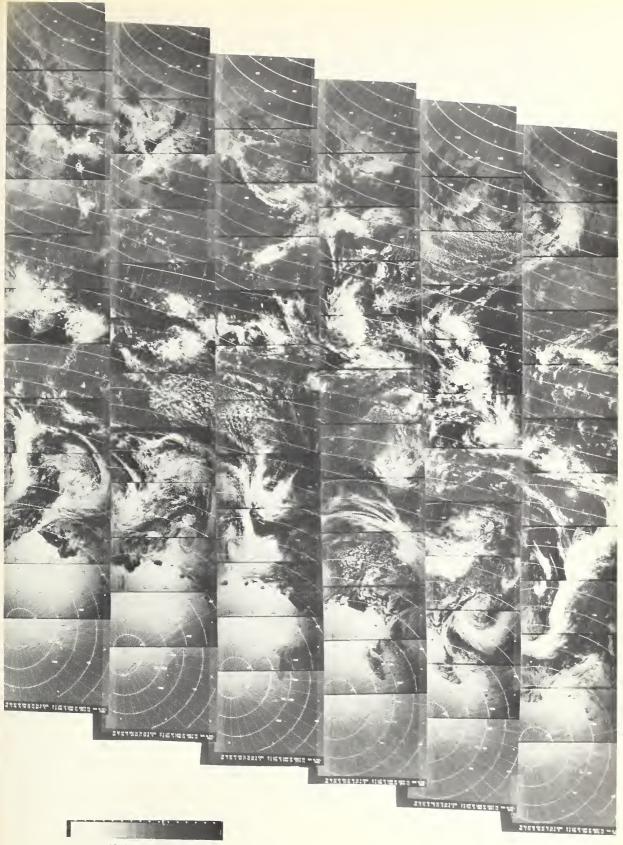
14 JANUARY 1968

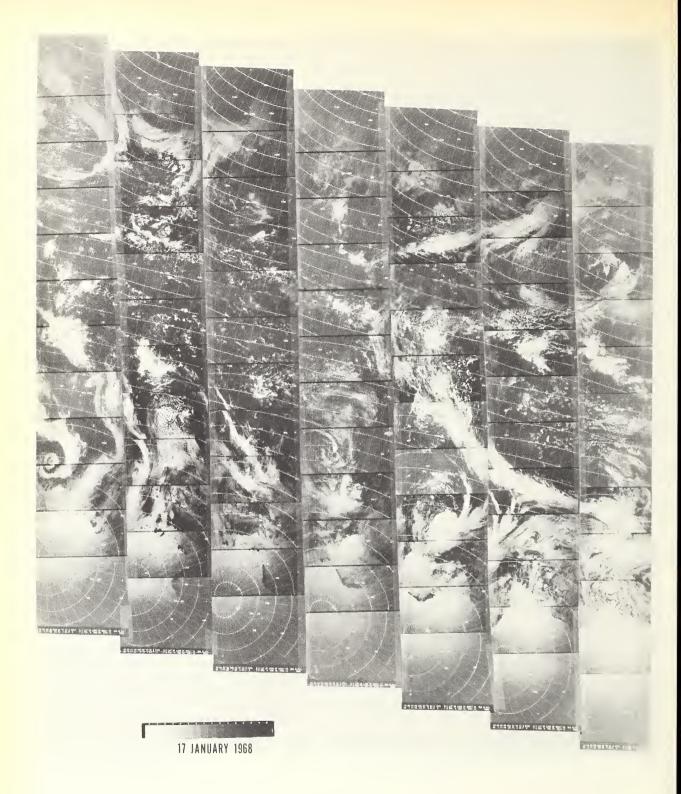




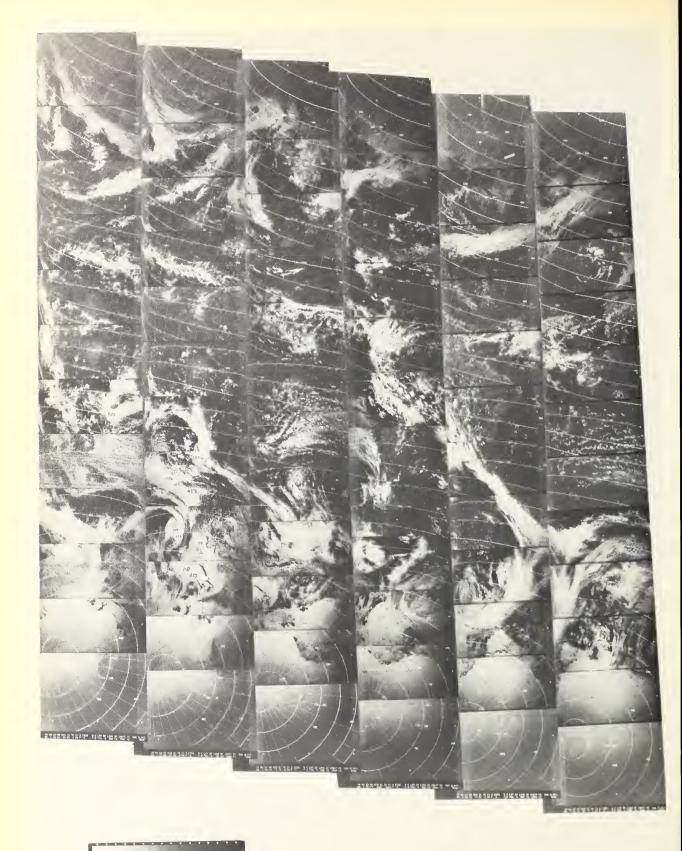
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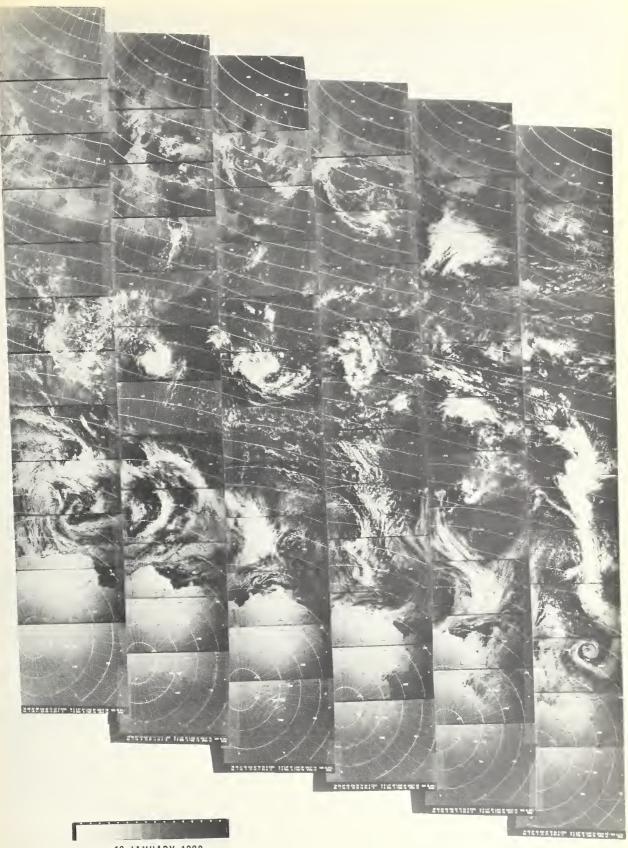


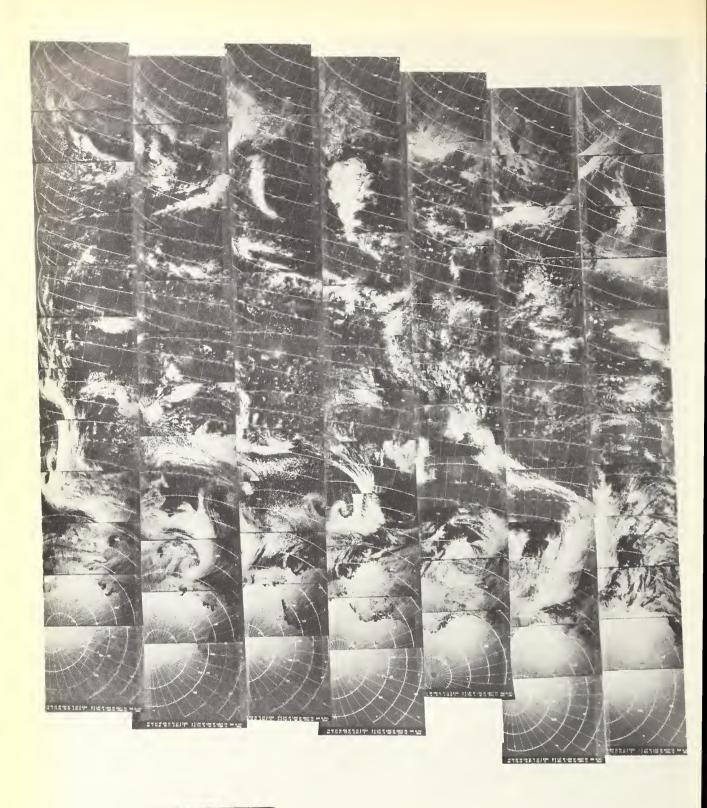




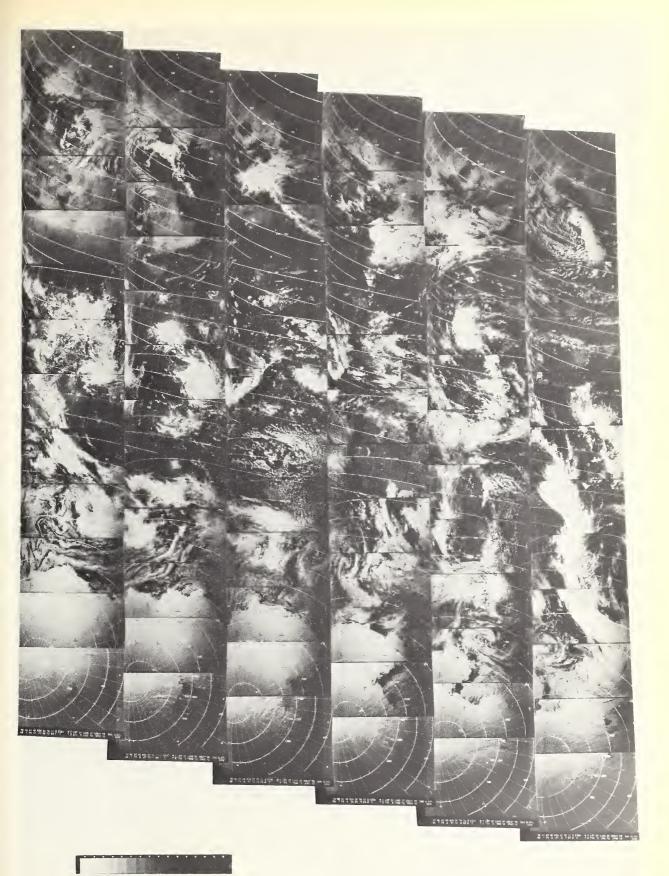


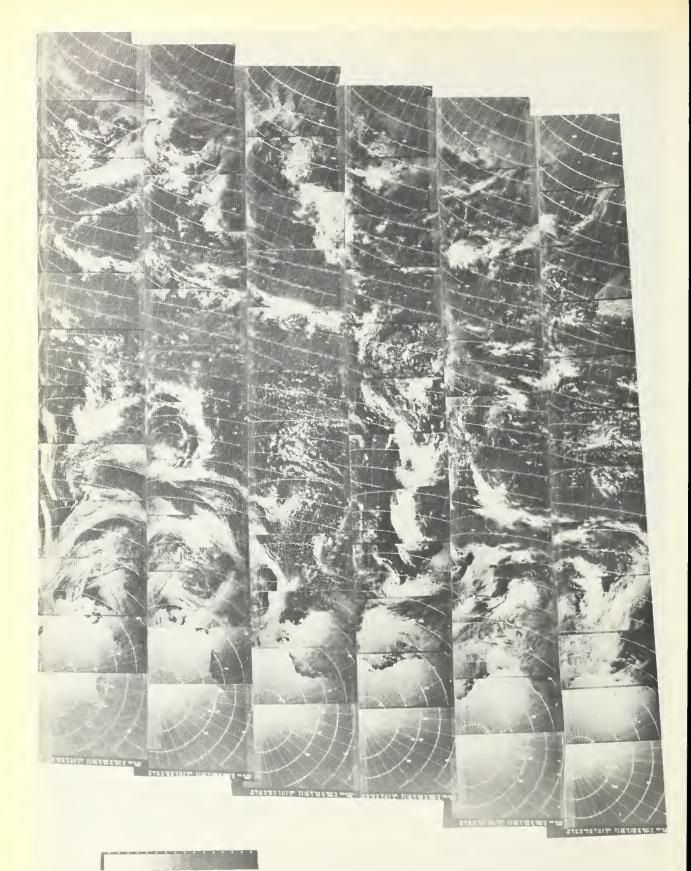




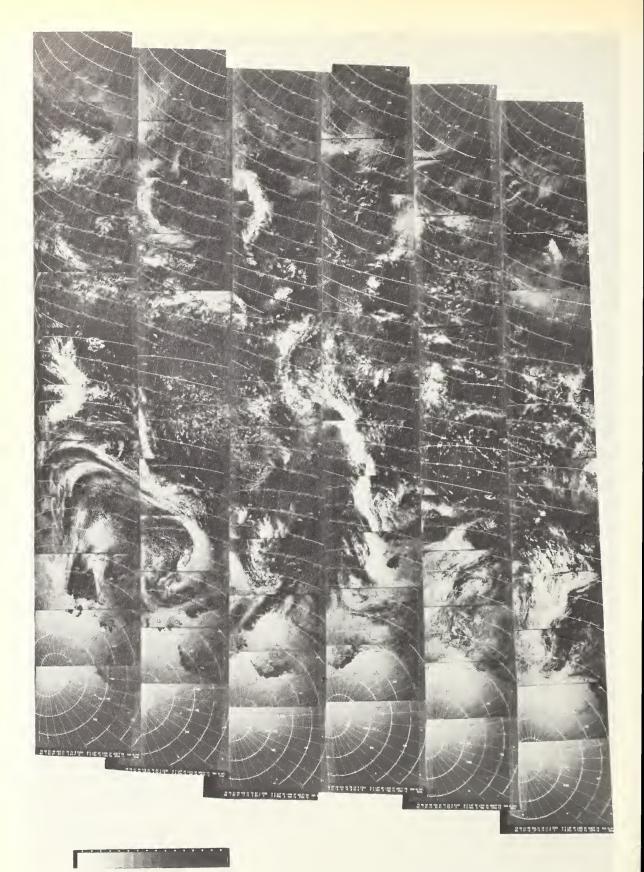


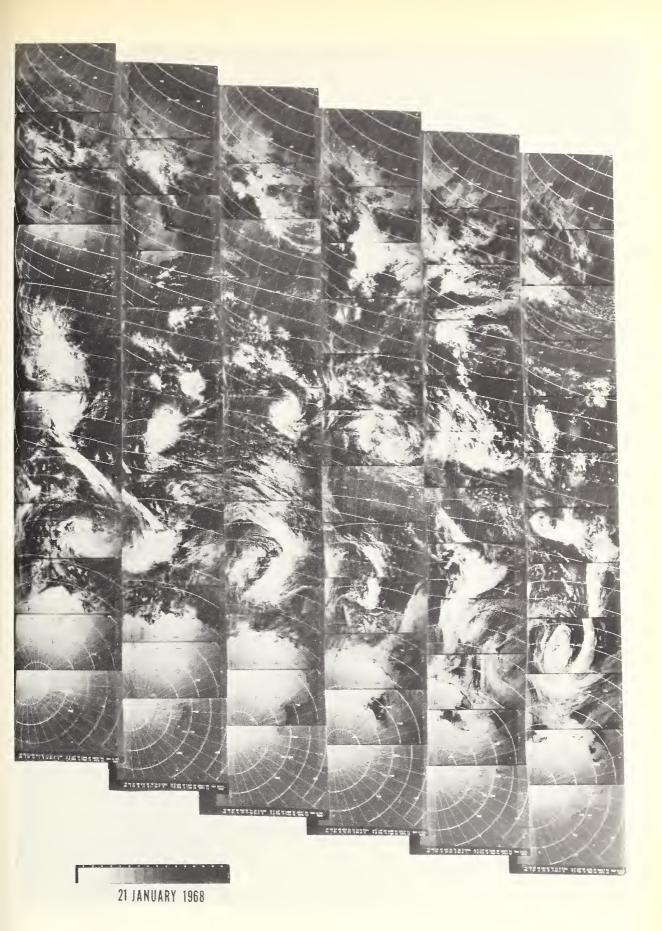


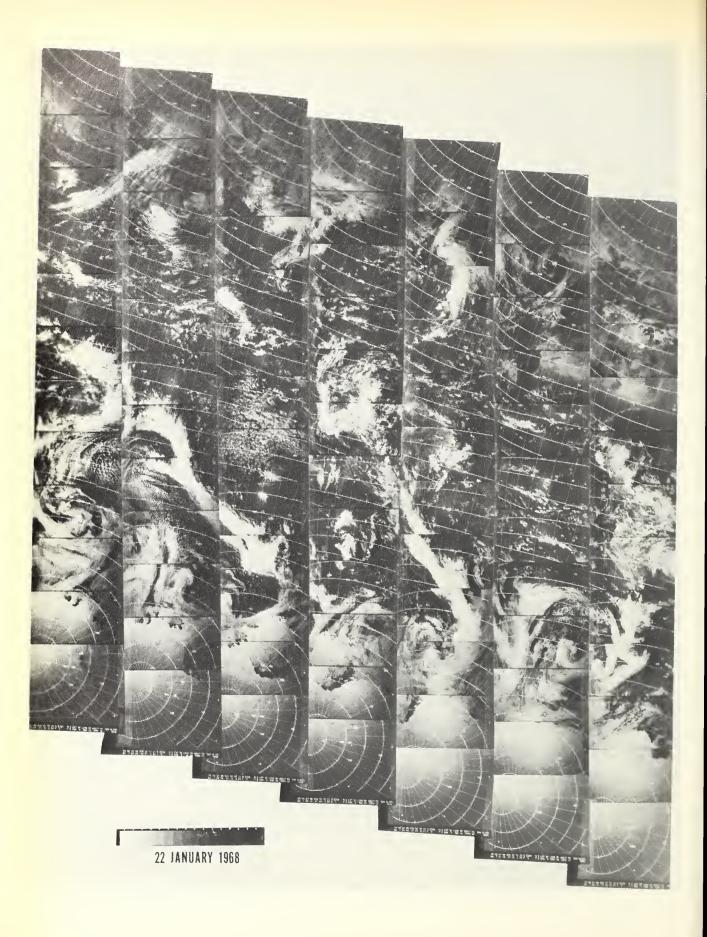


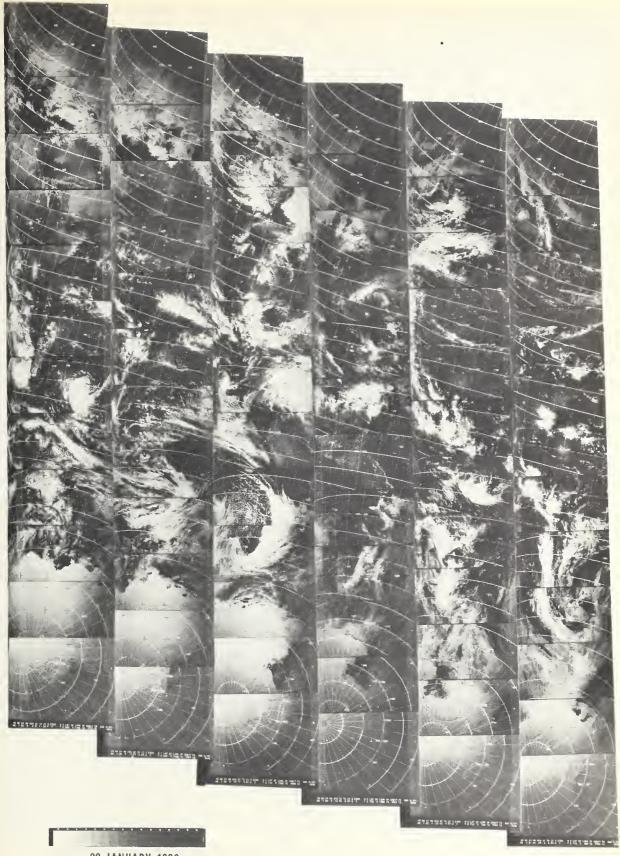




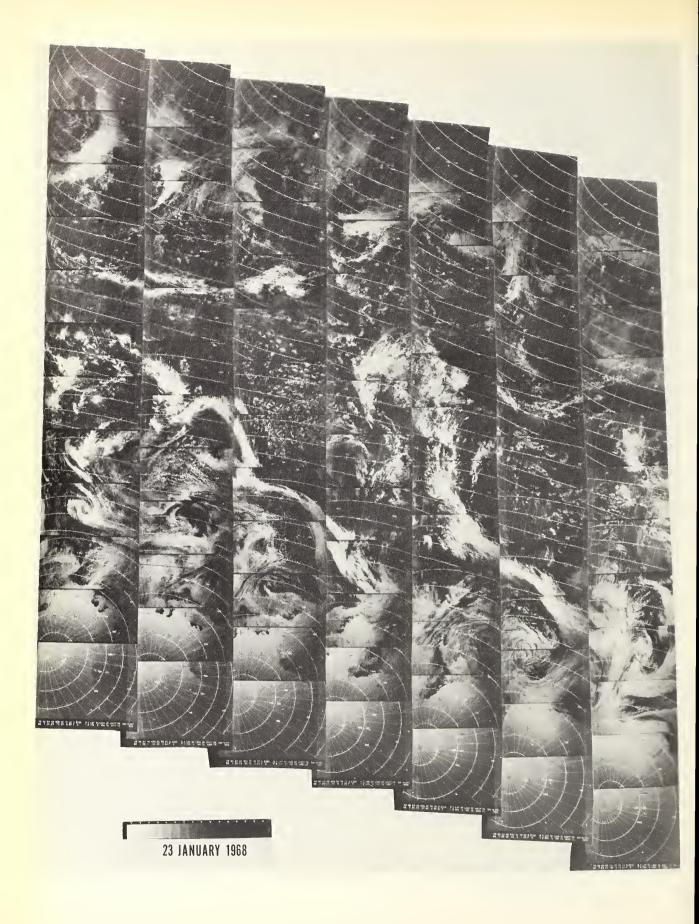




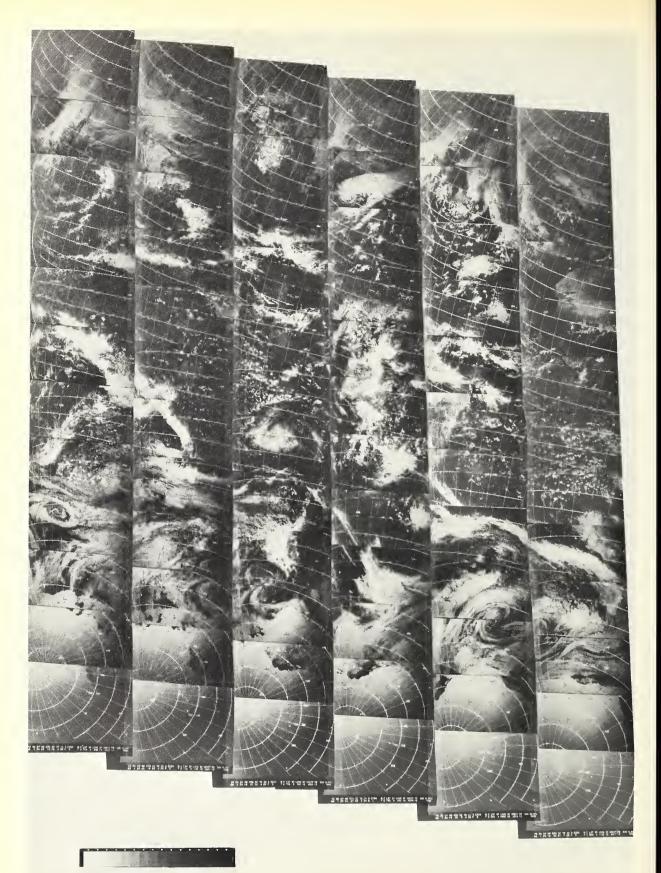




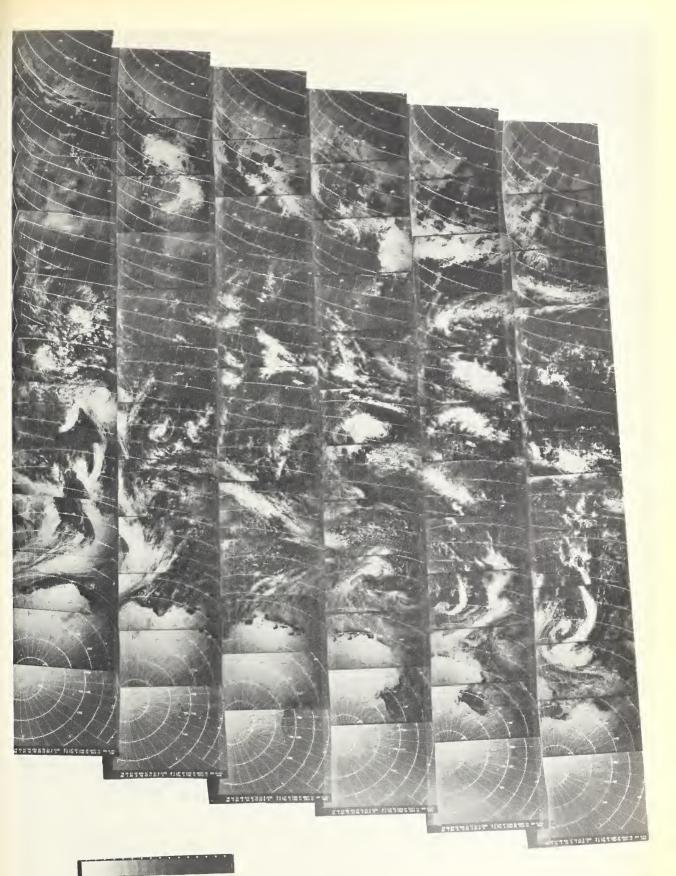
22 JANUARY 1968

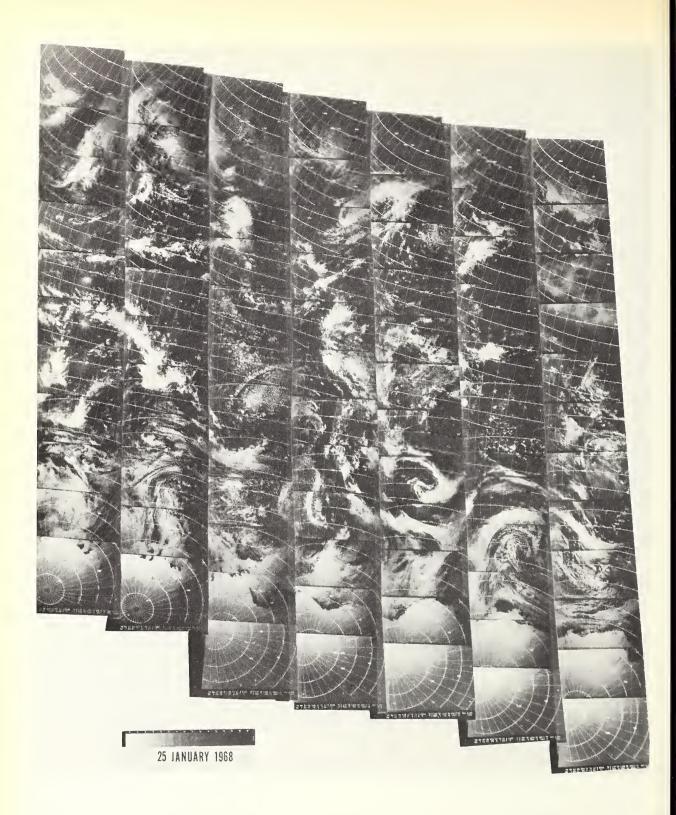




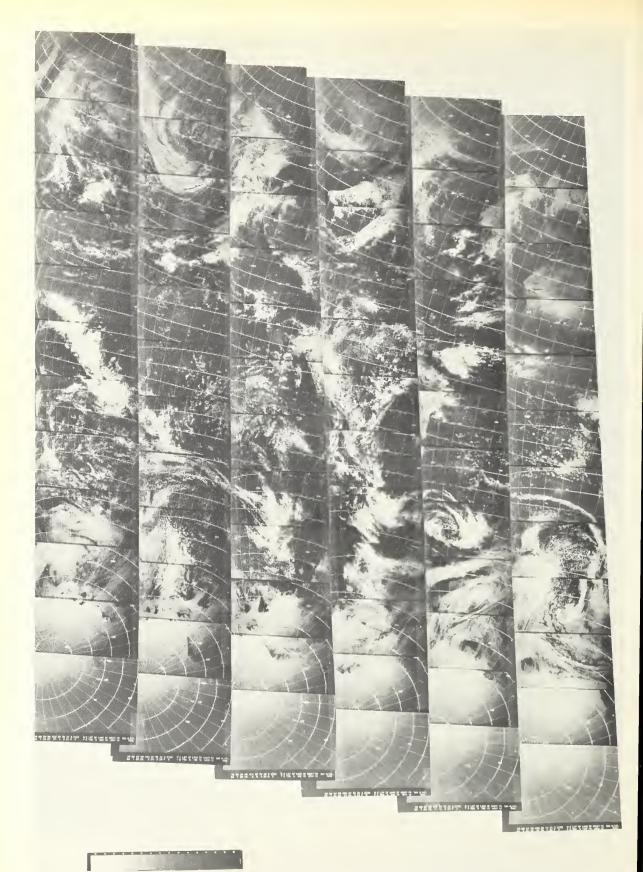


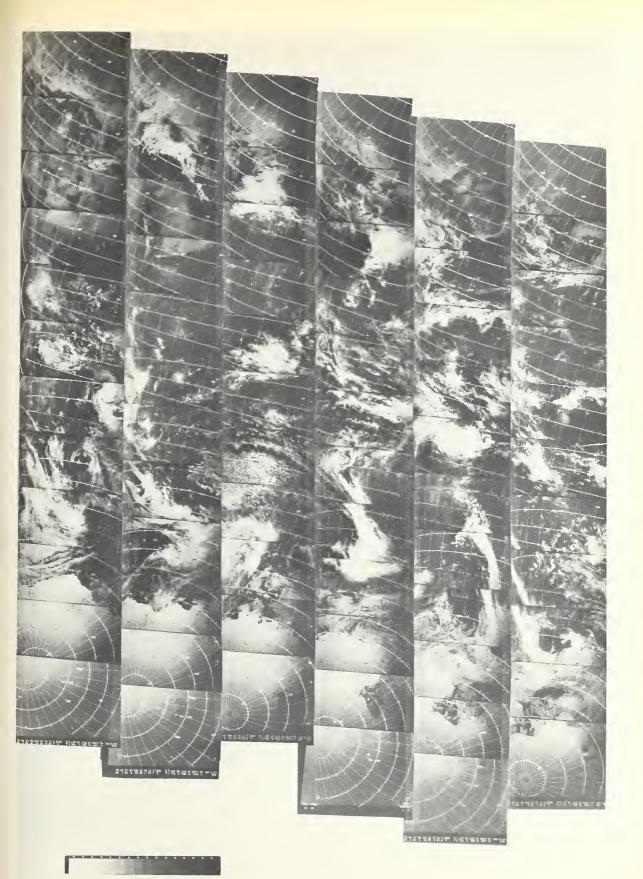
24 JANUARY 1968

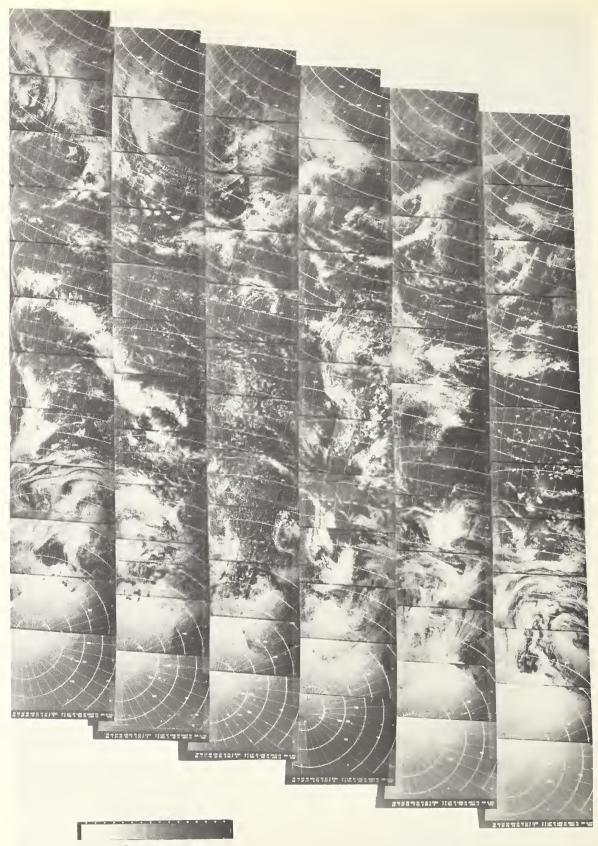




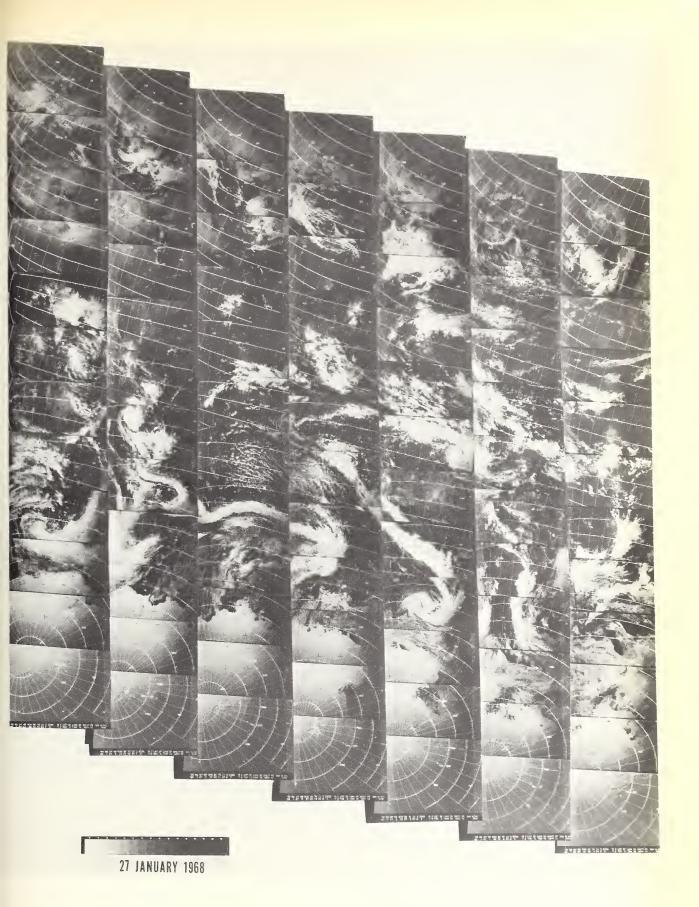


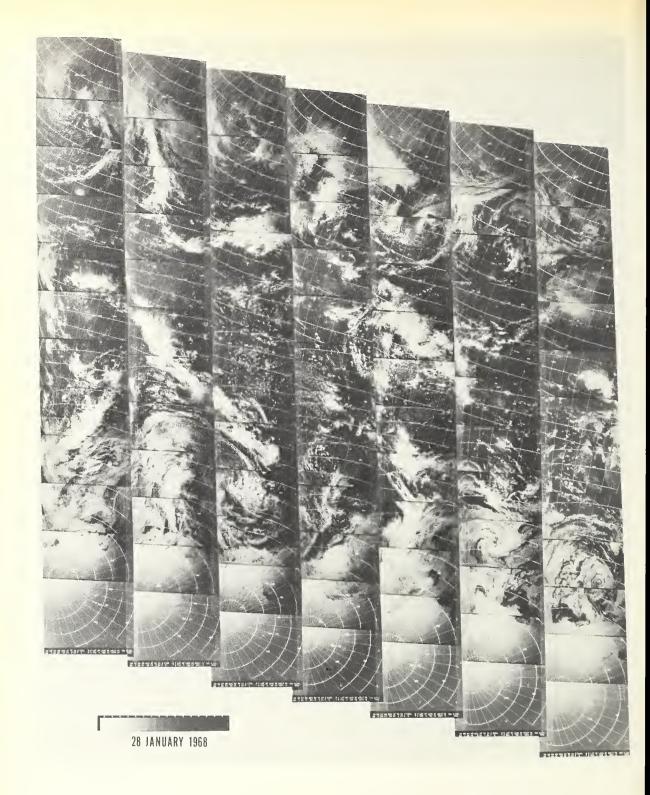




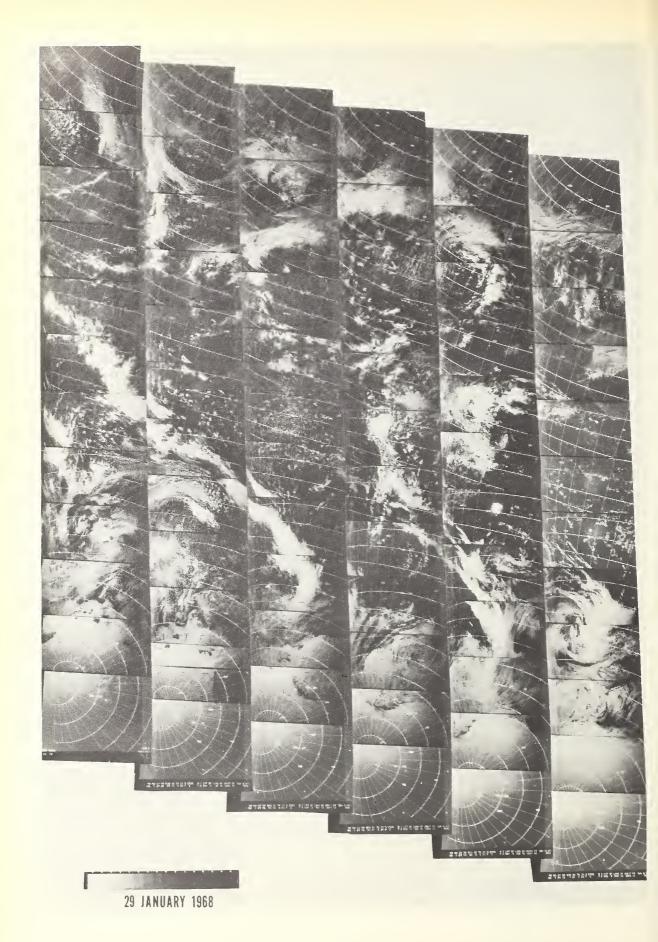


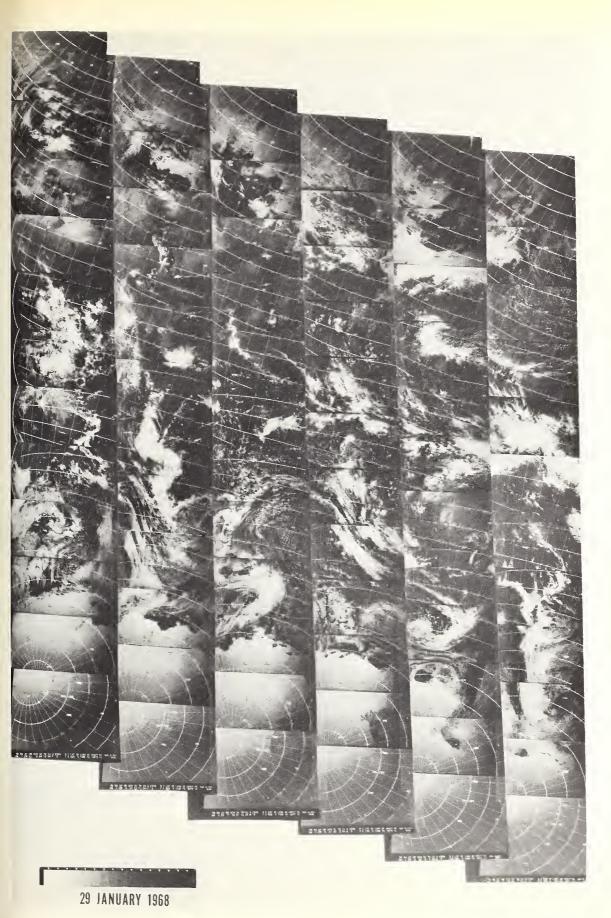
27 JANUARY 1968



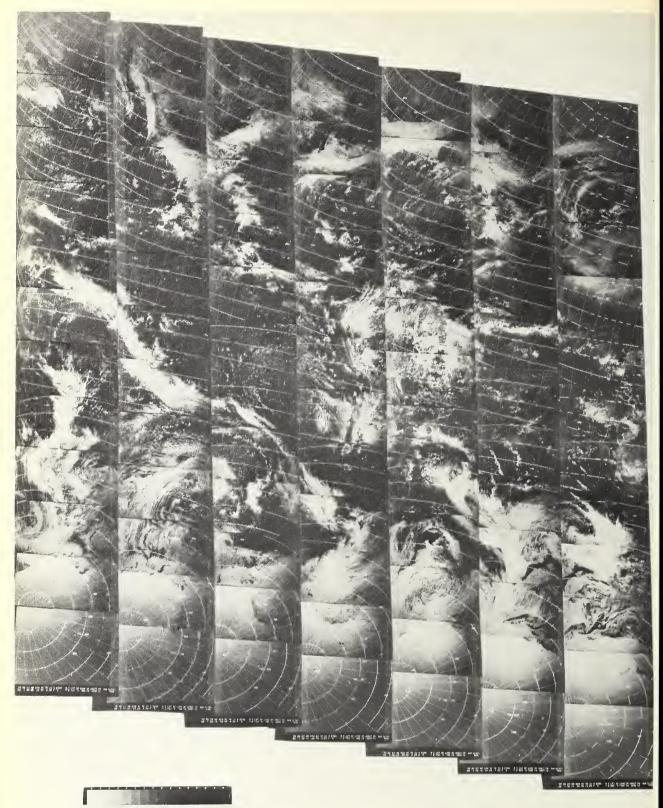




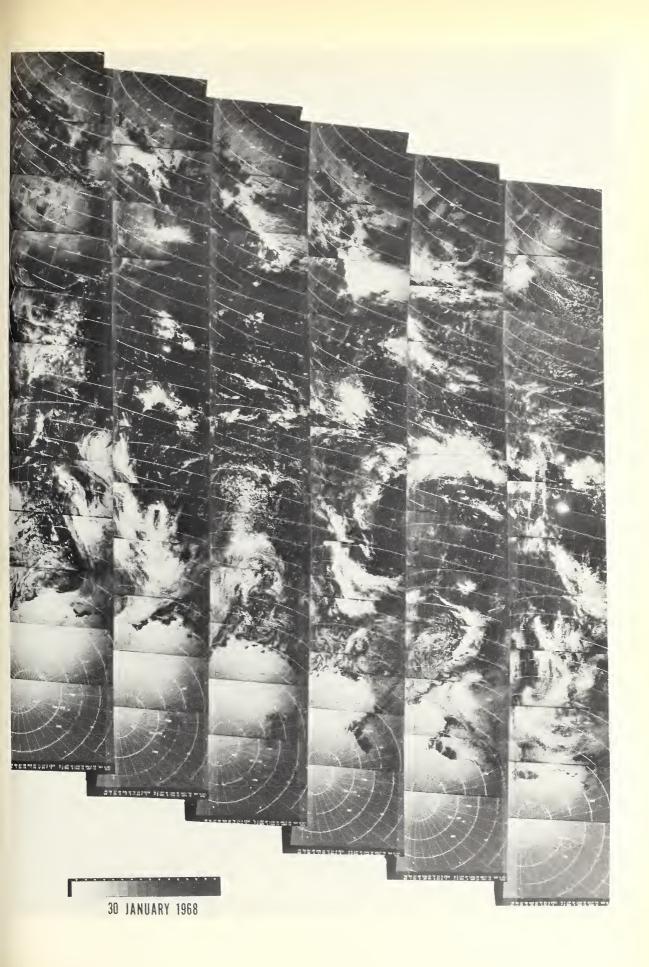


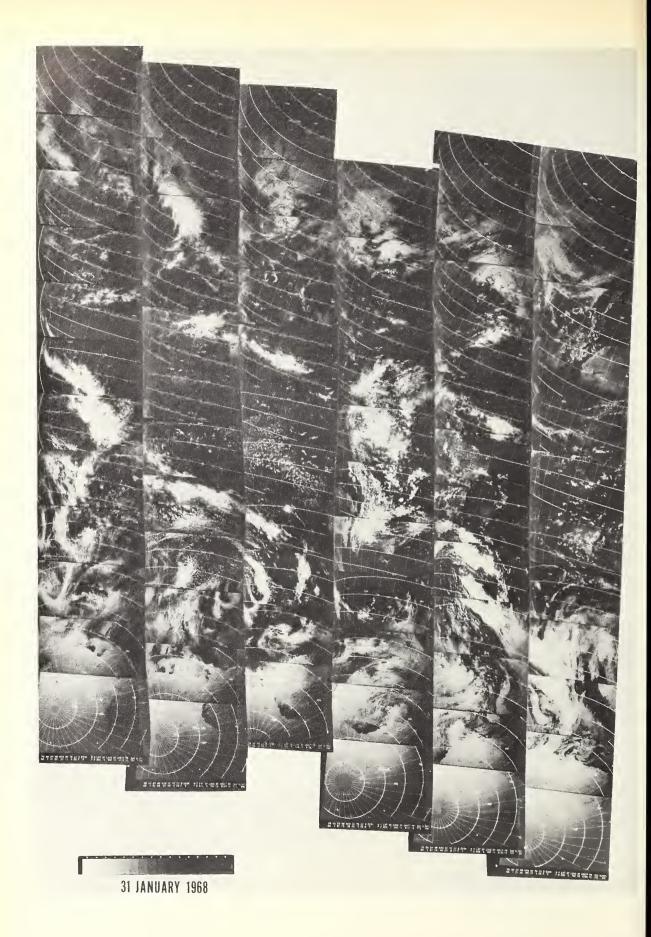


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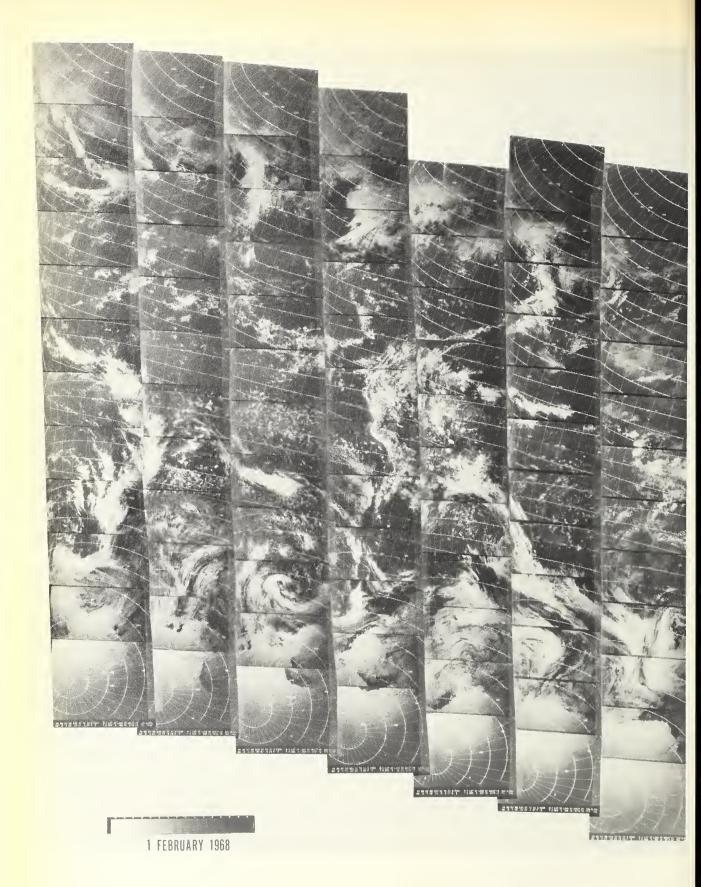


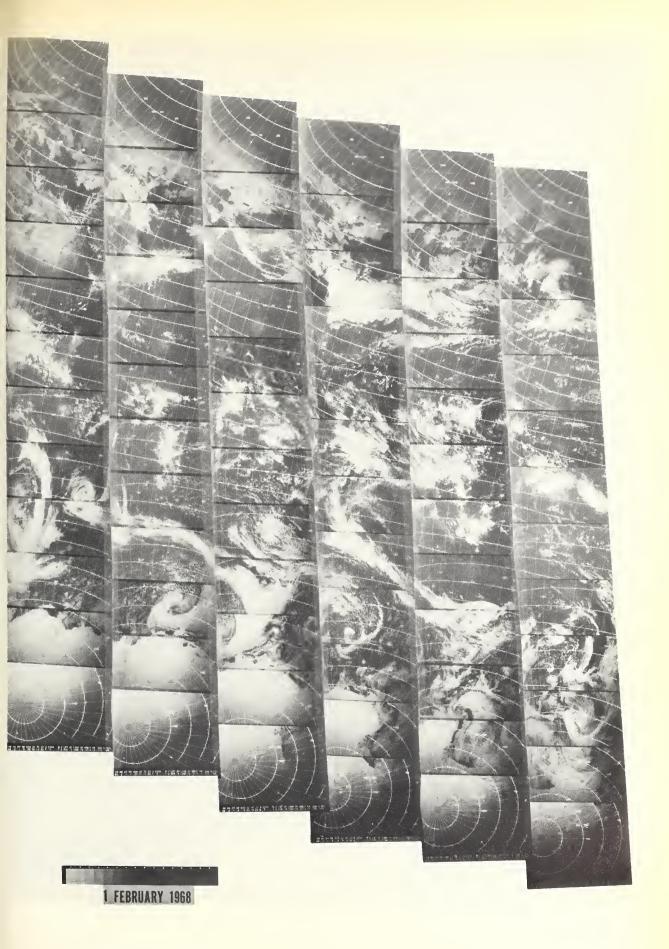
30 JANUARY 1968

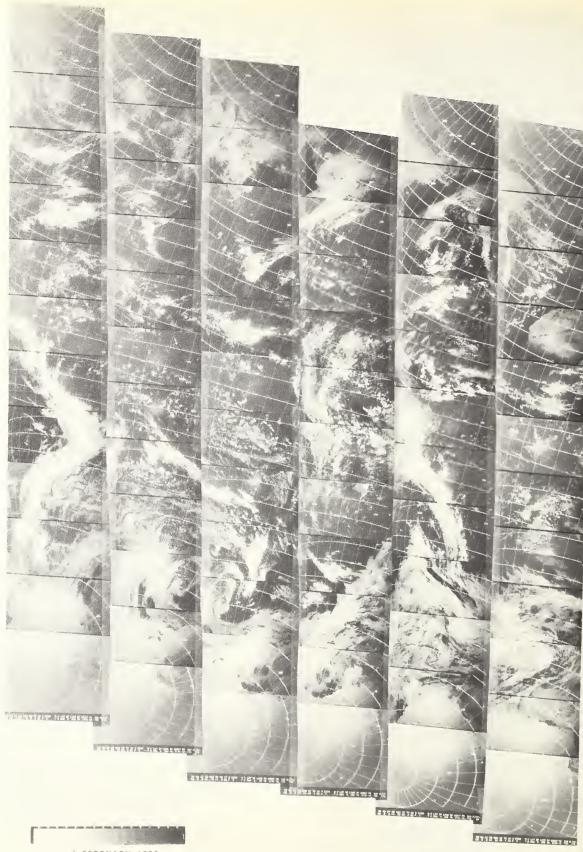






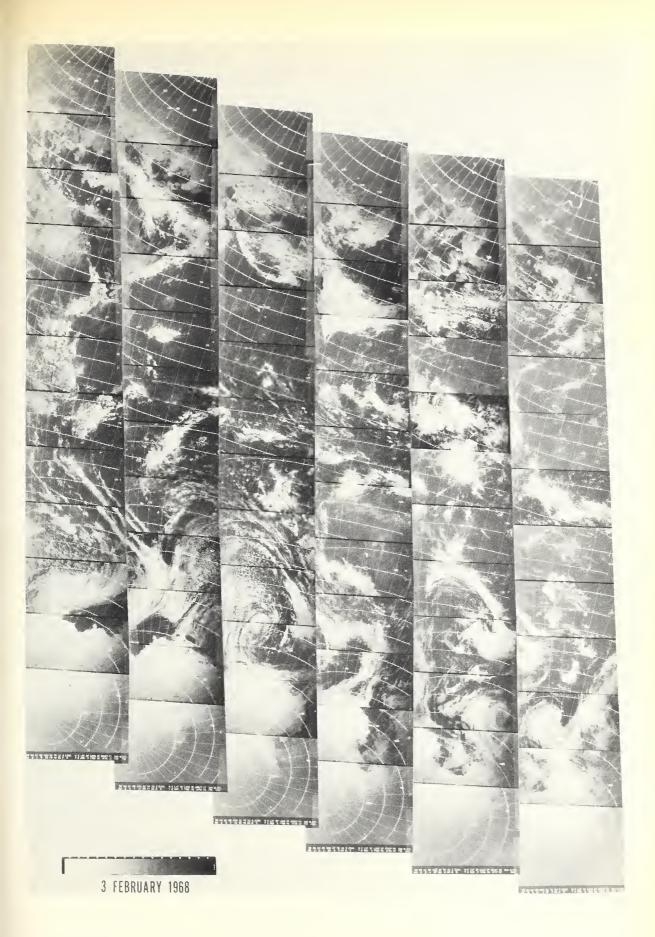


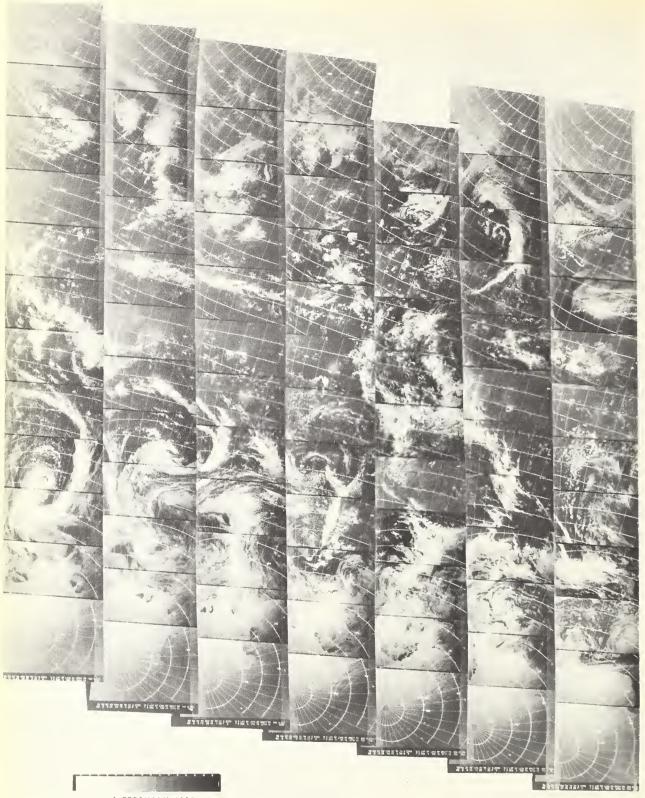




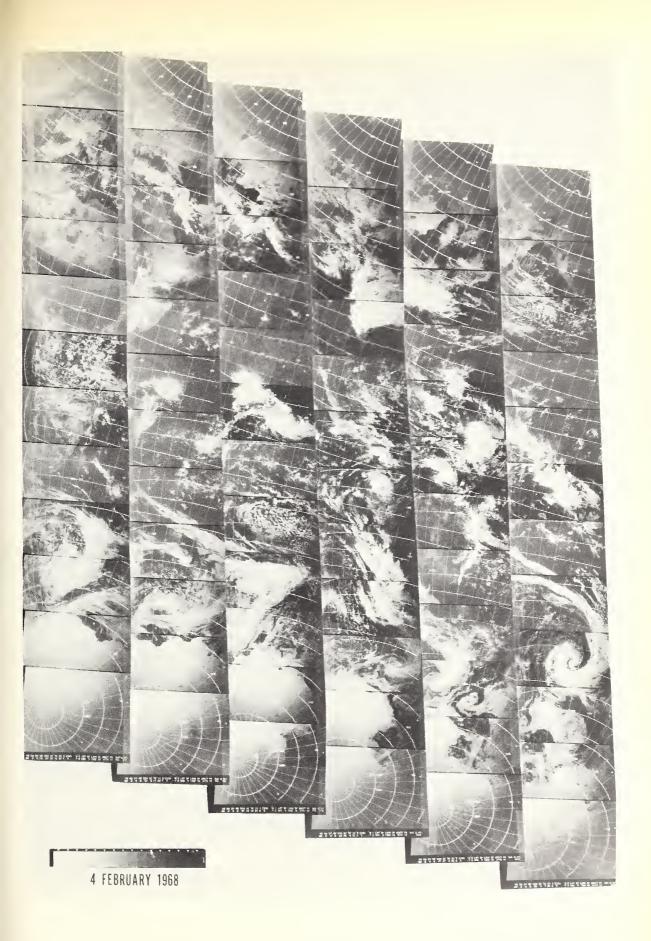


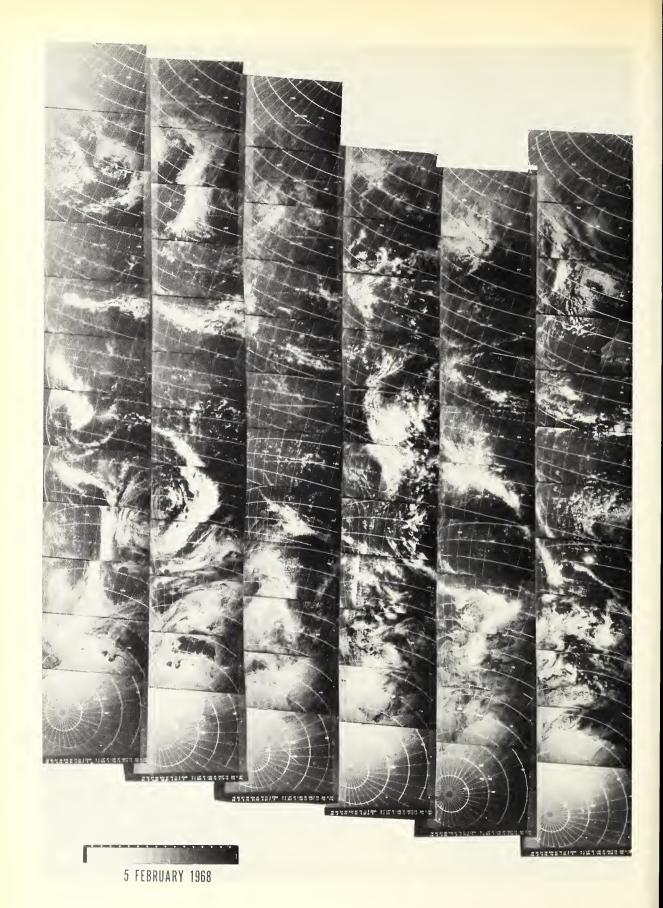


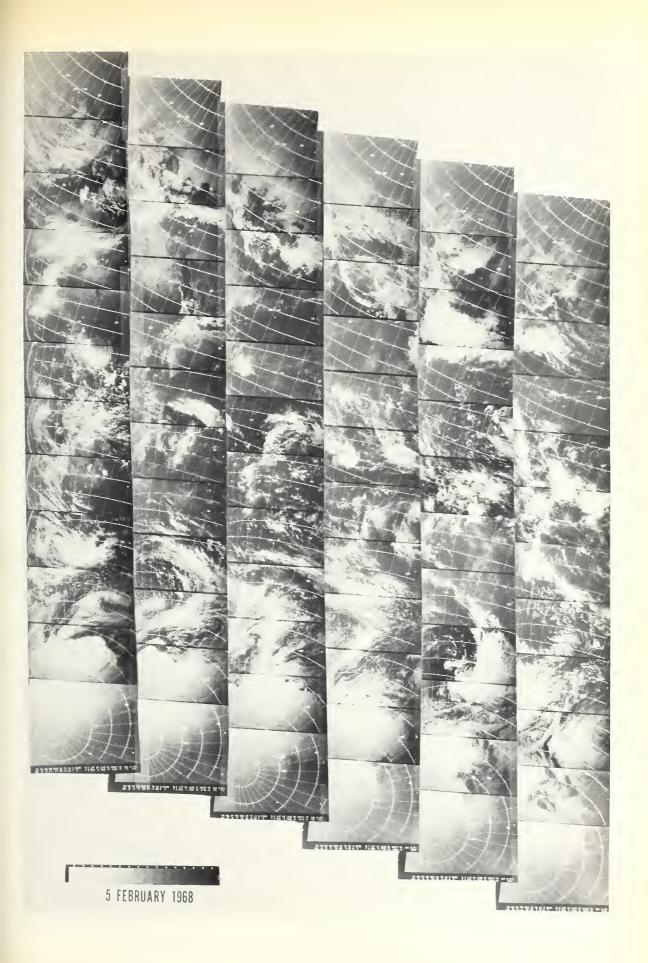


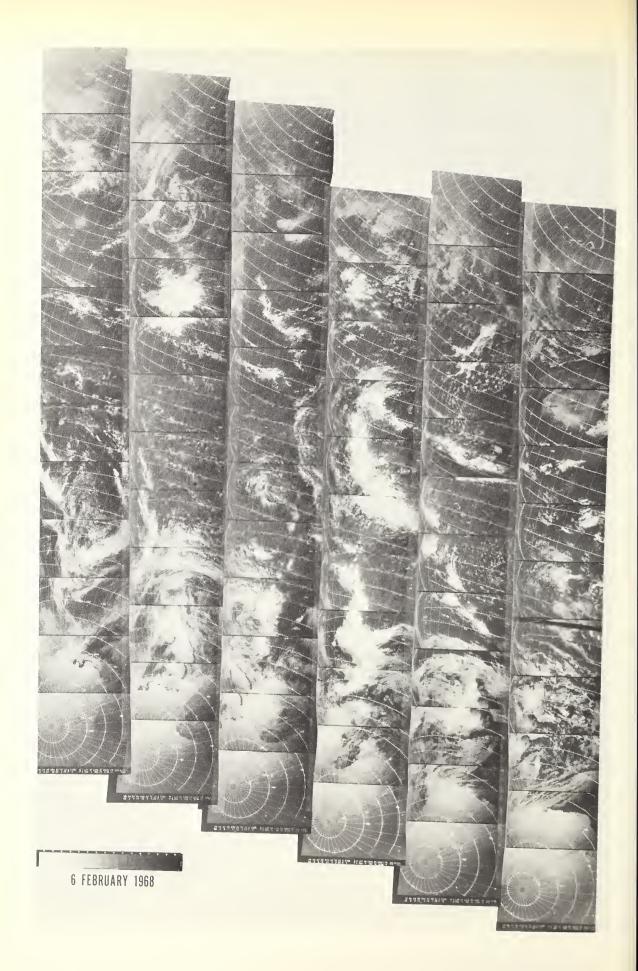


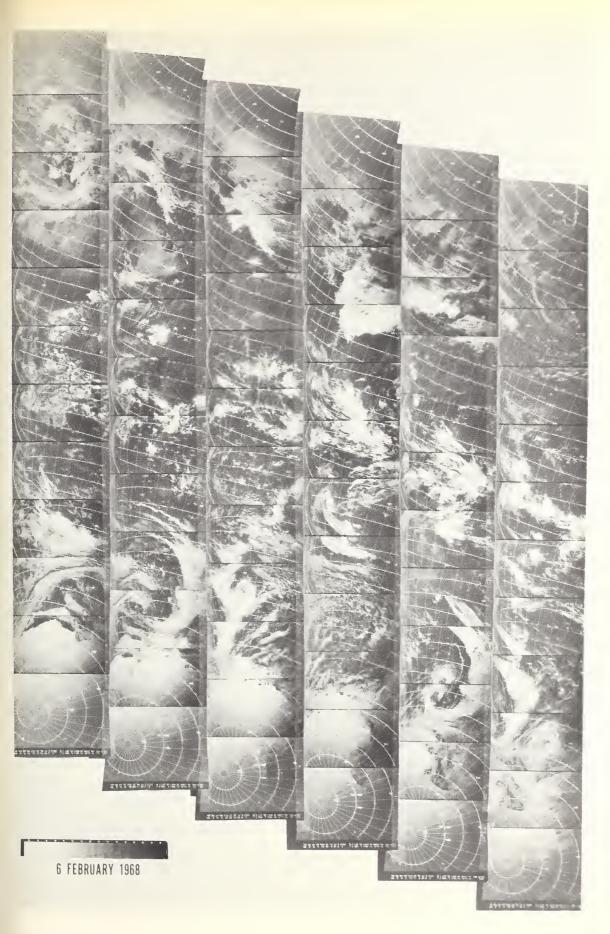
4 FEBRUARY 1968





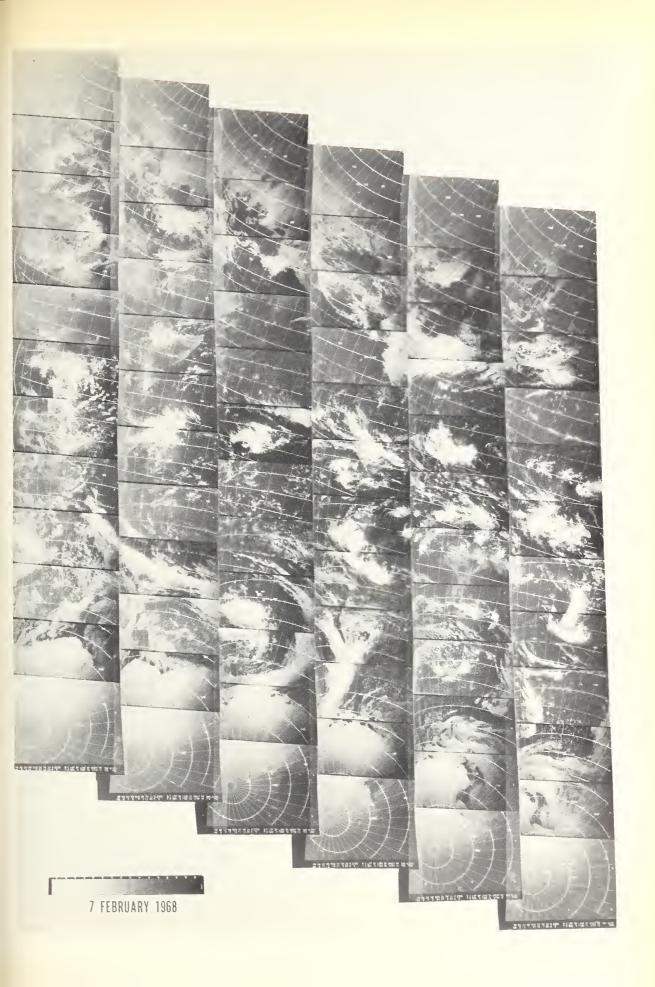


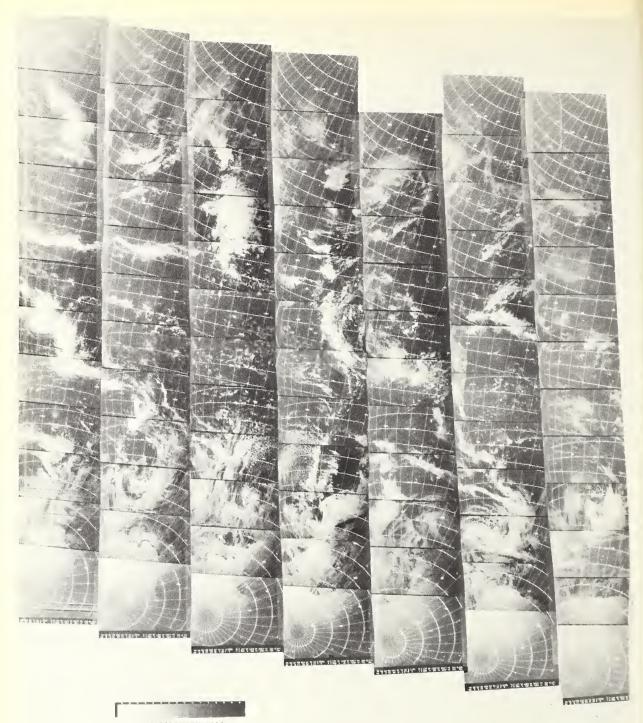






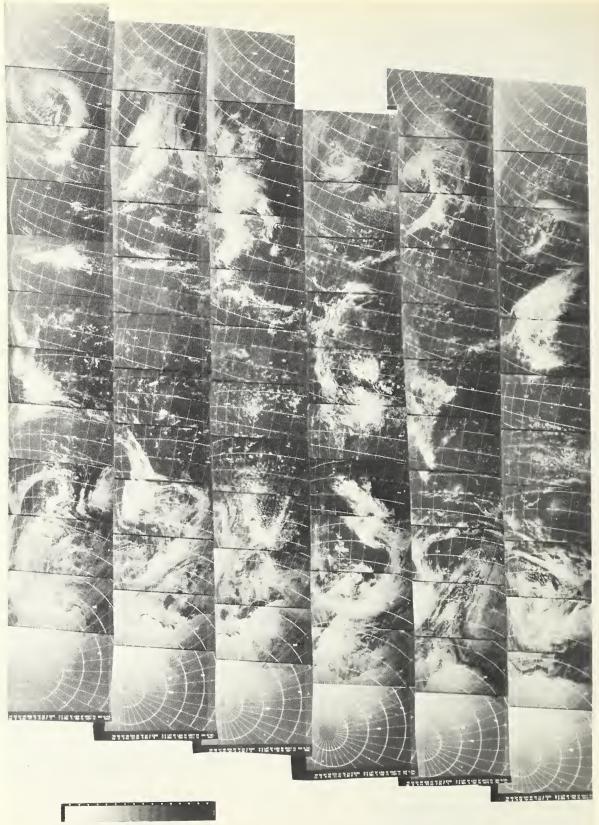
7 FEBRUARY 1968



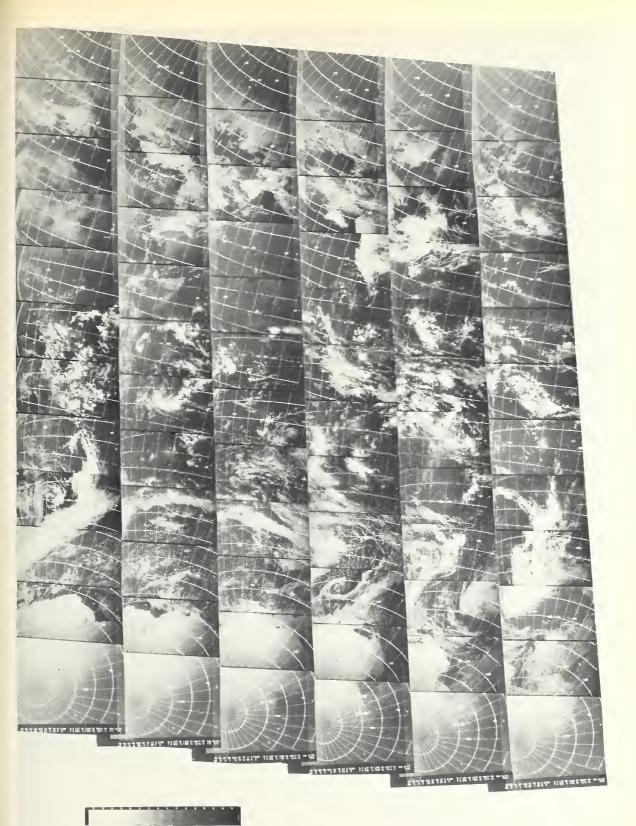


8 FEBRUARY 1968

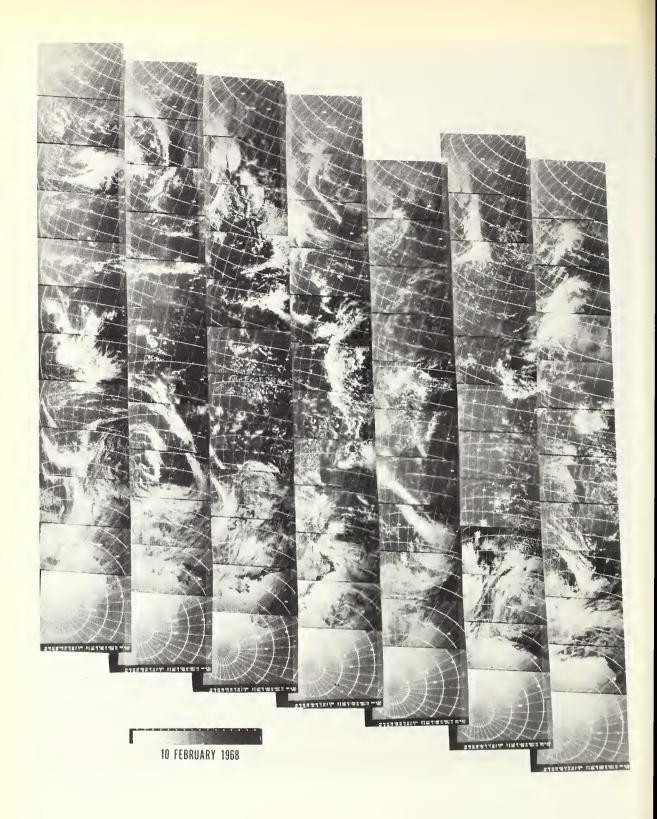


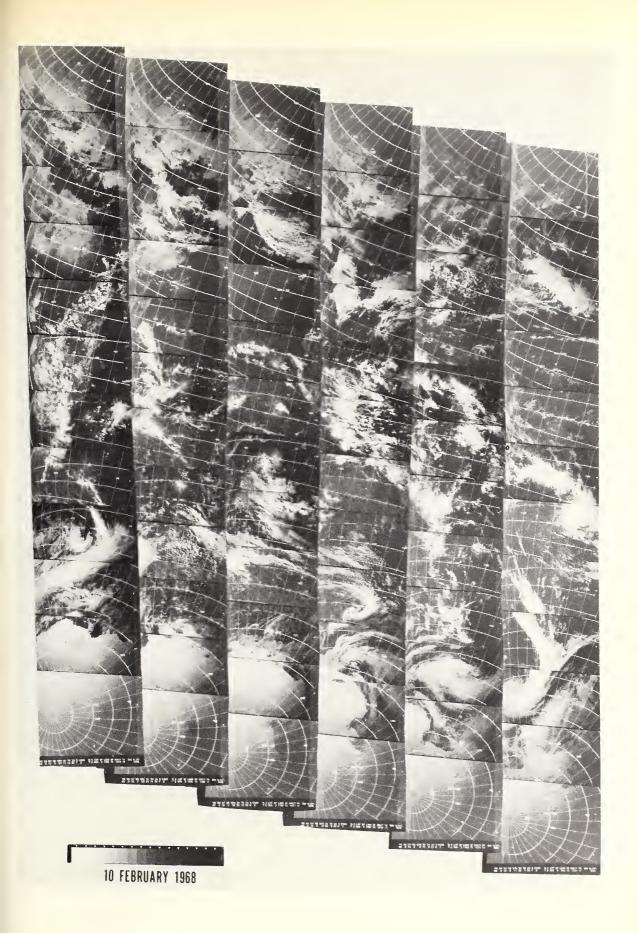


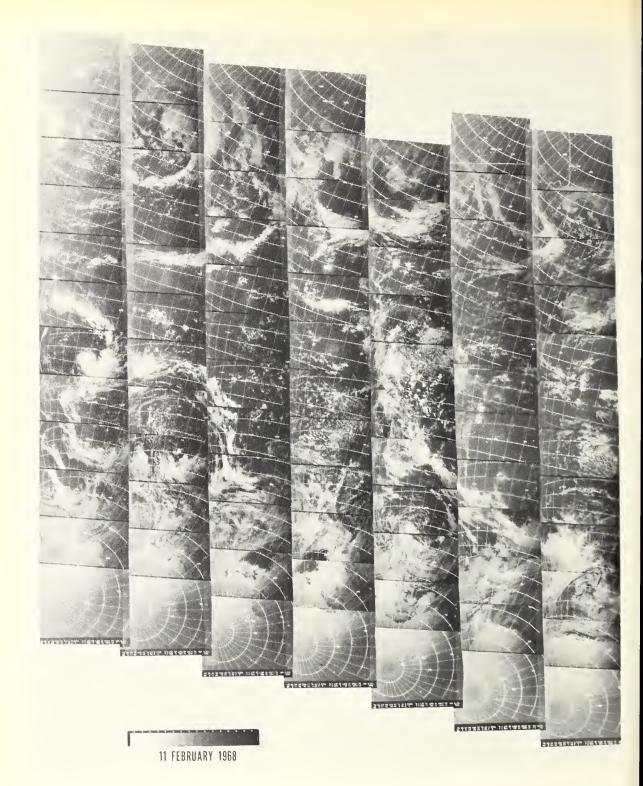
9 FEBRUARY 1968

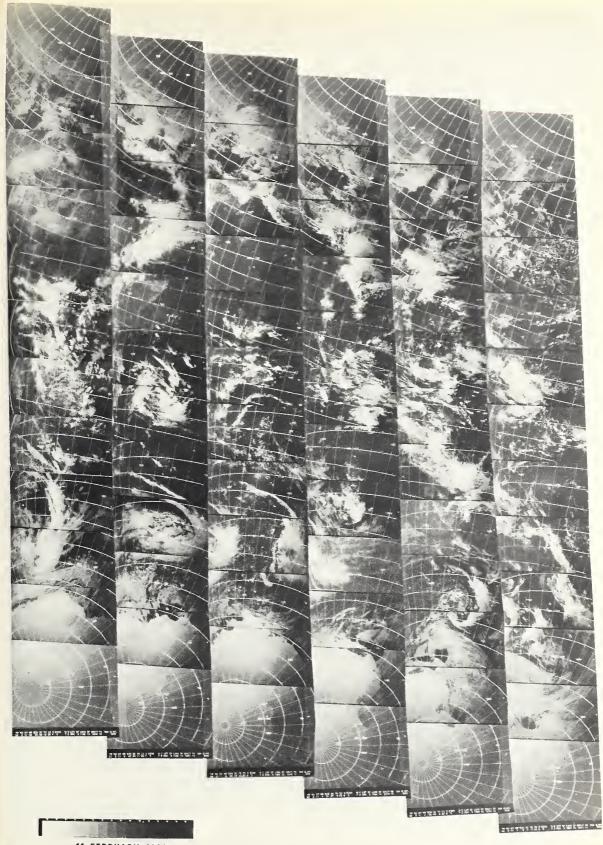


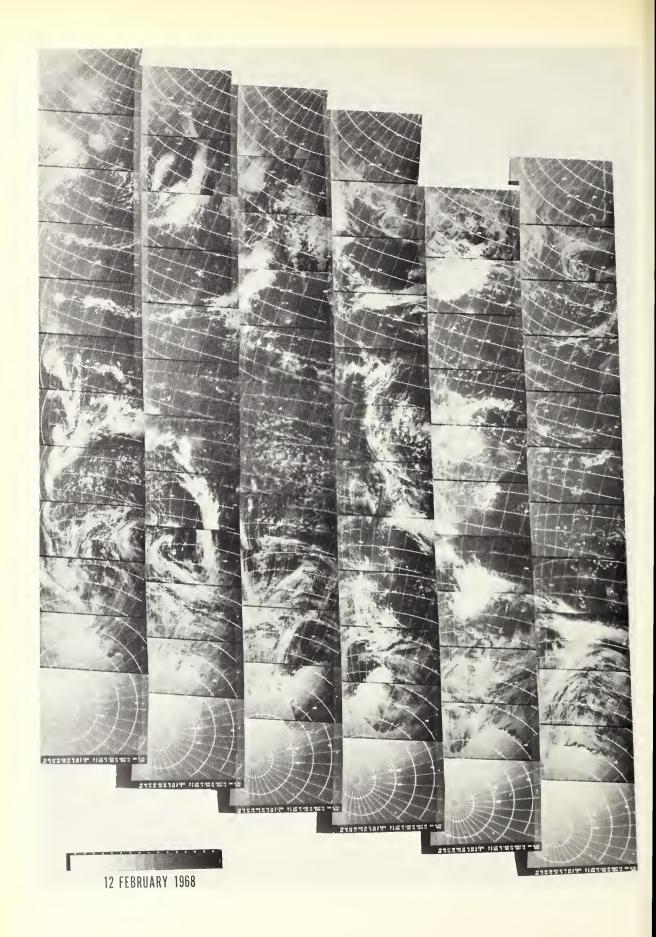
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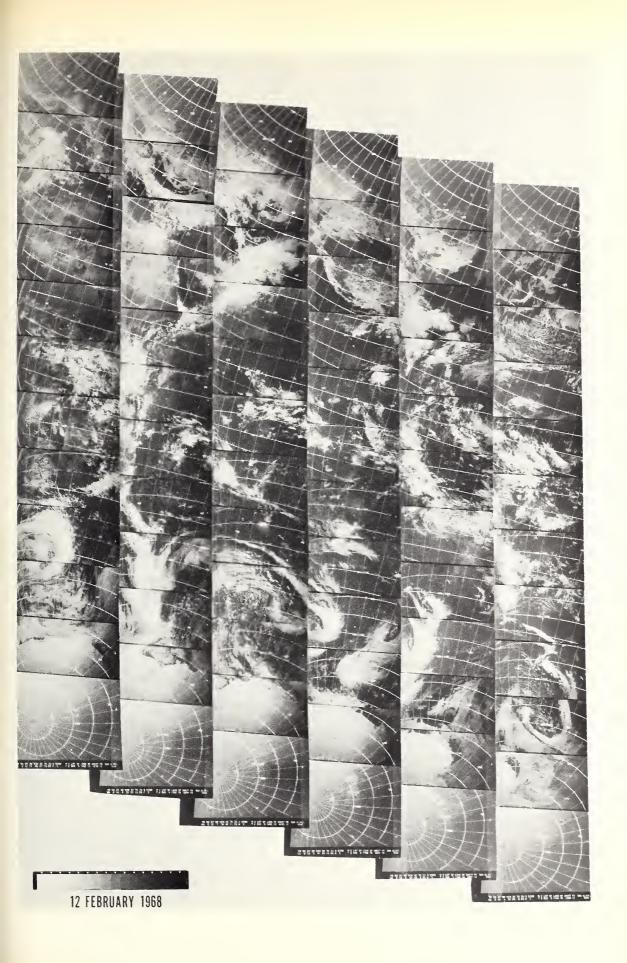


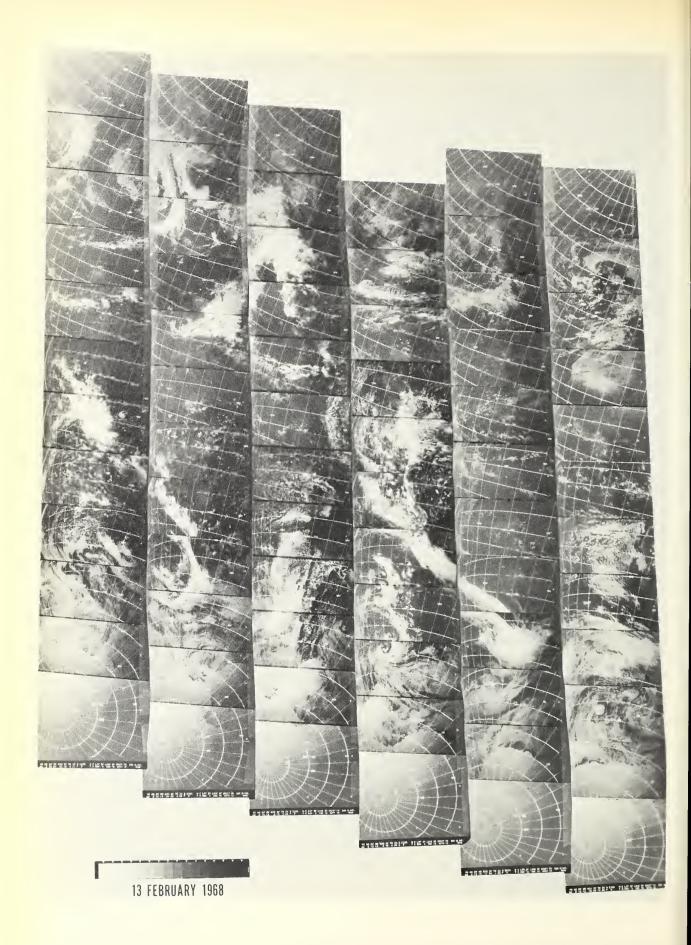


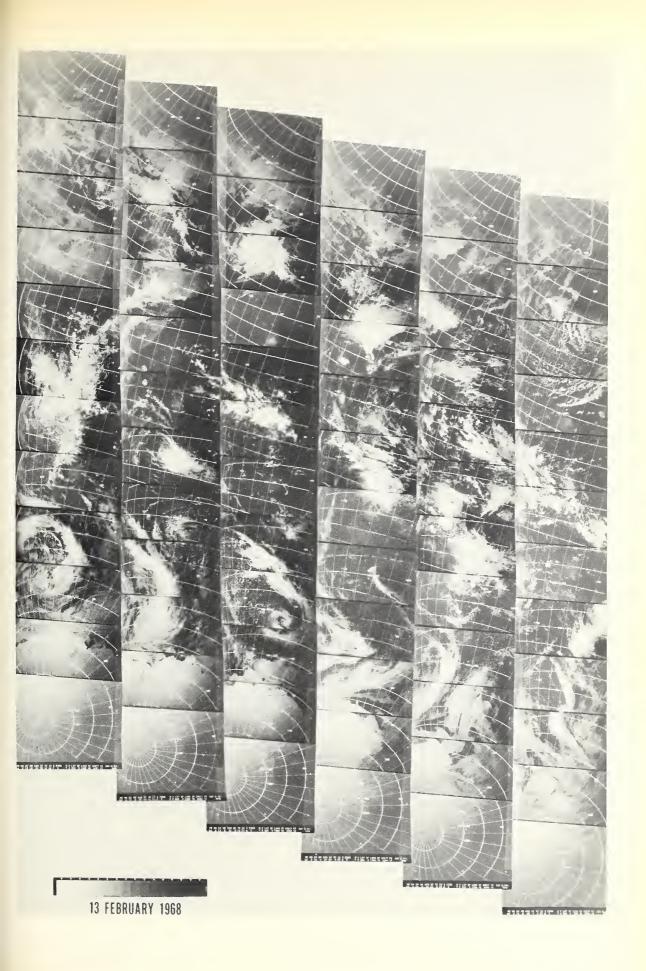




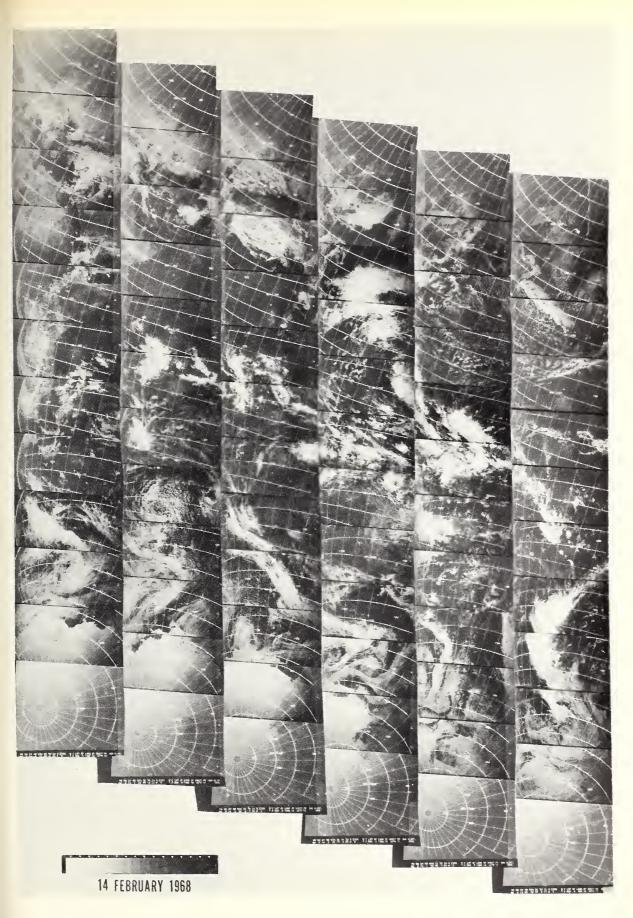


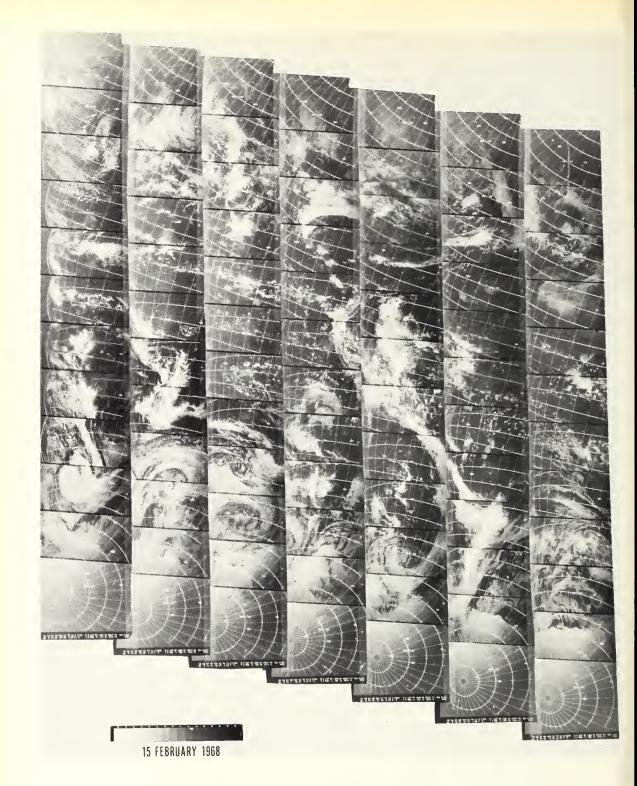


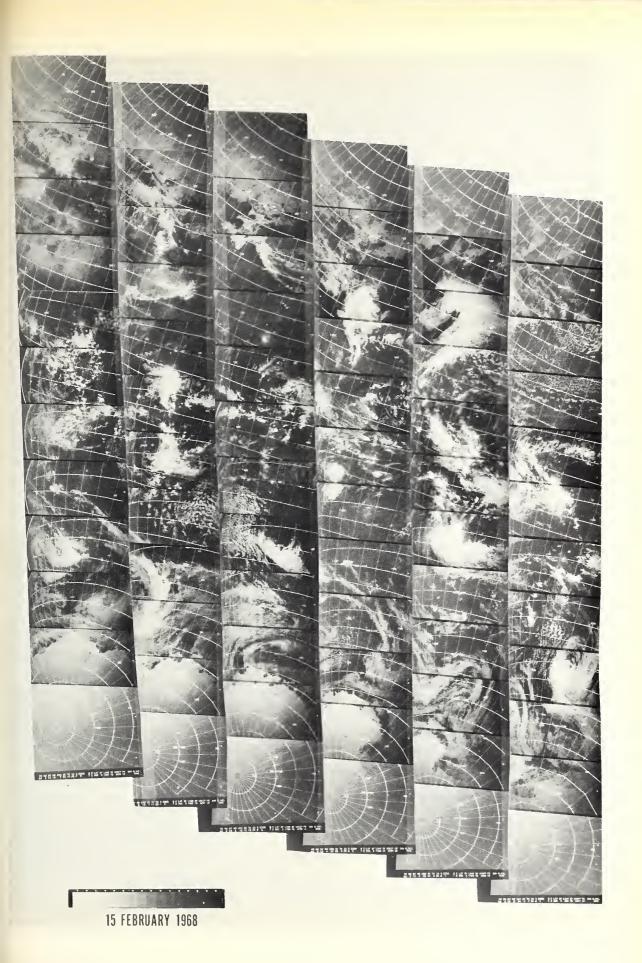


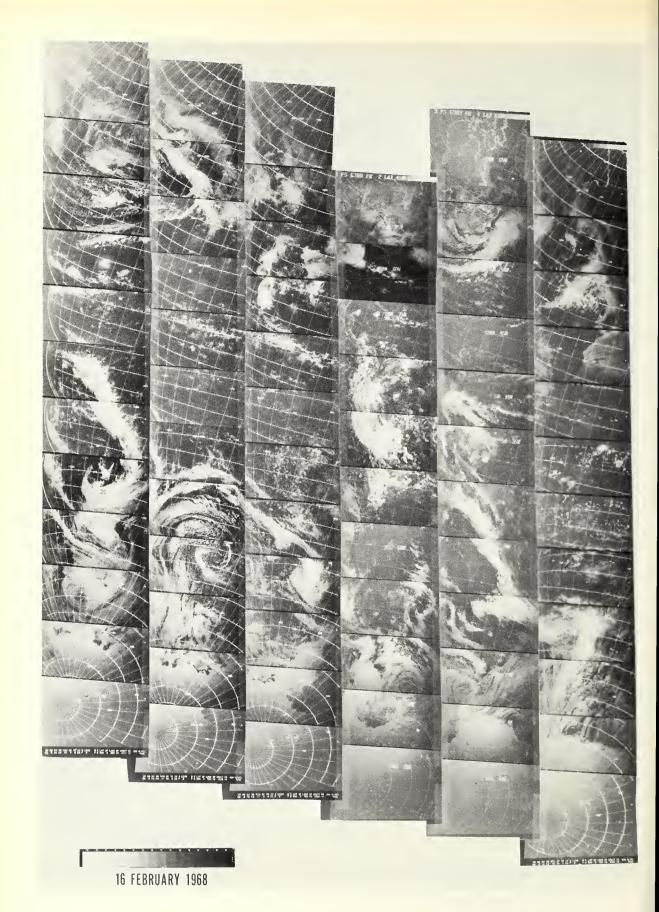


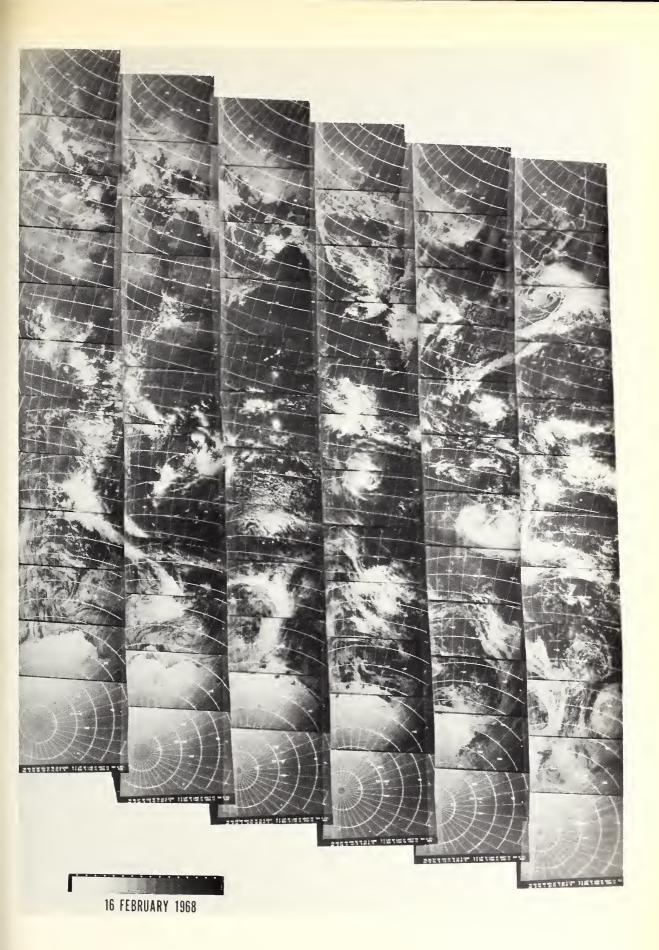


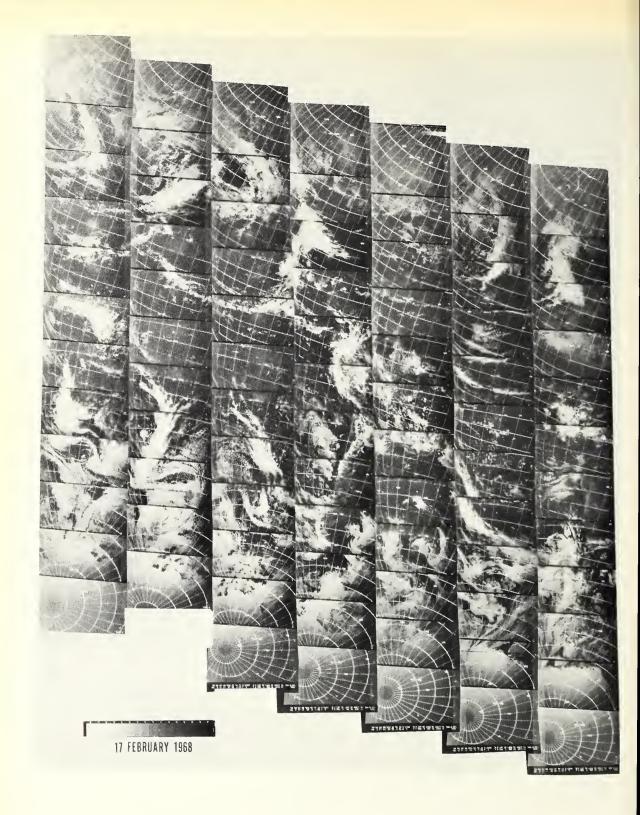


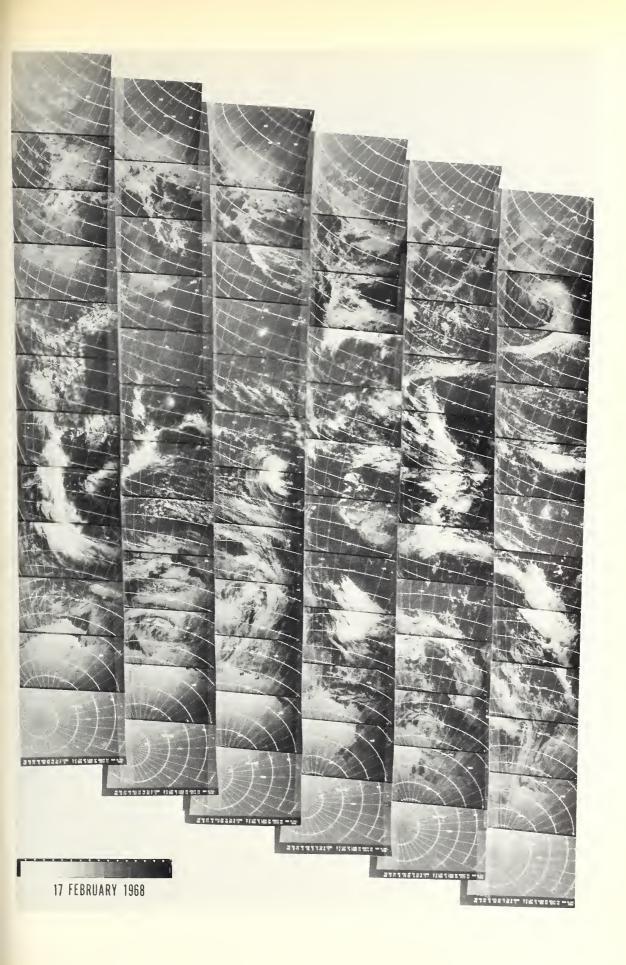


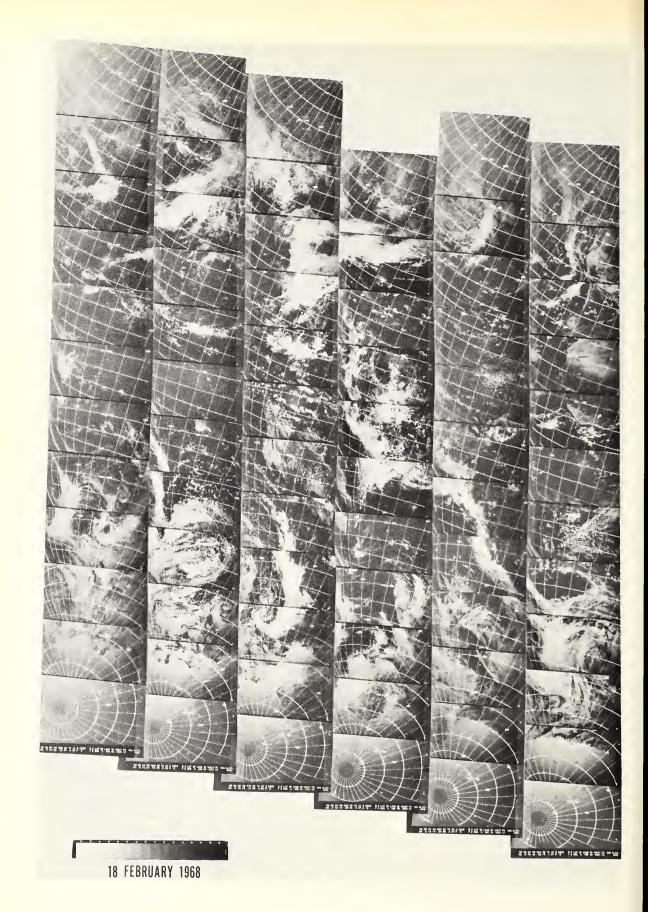


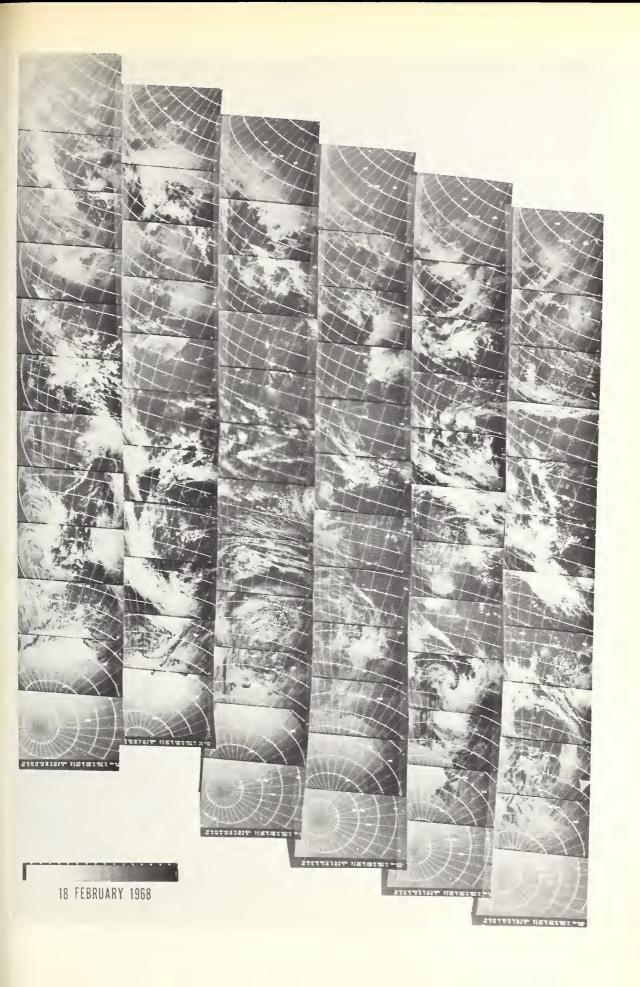


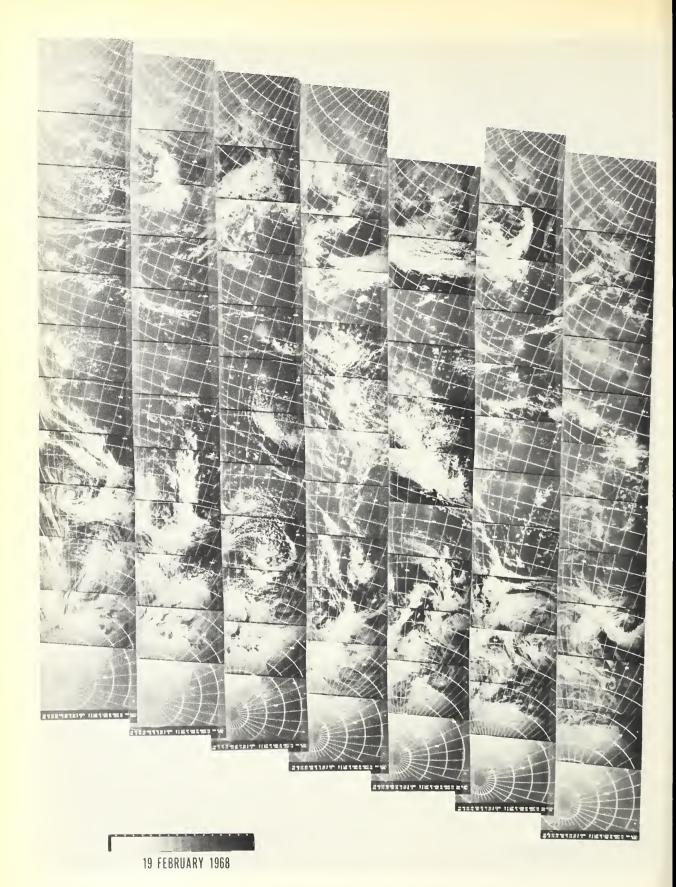


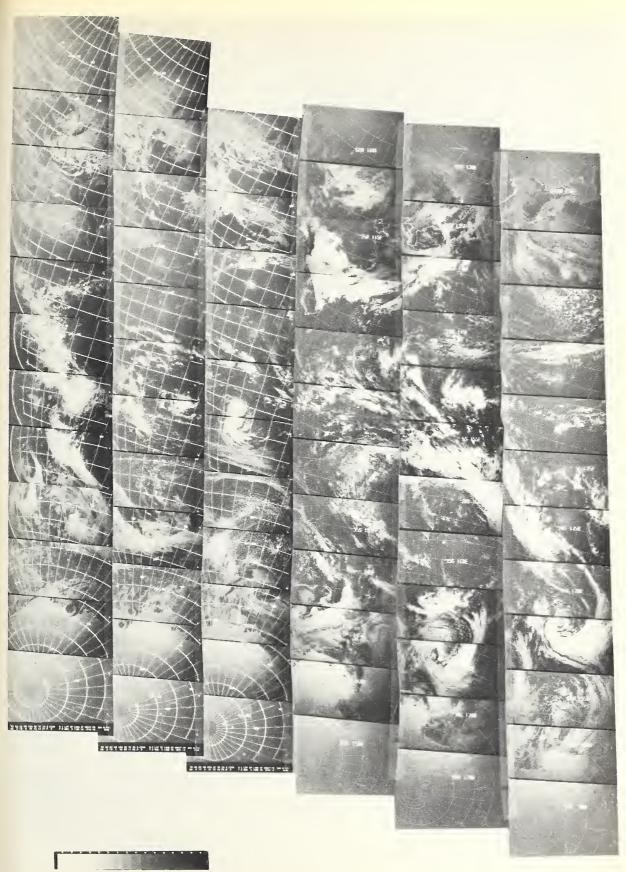


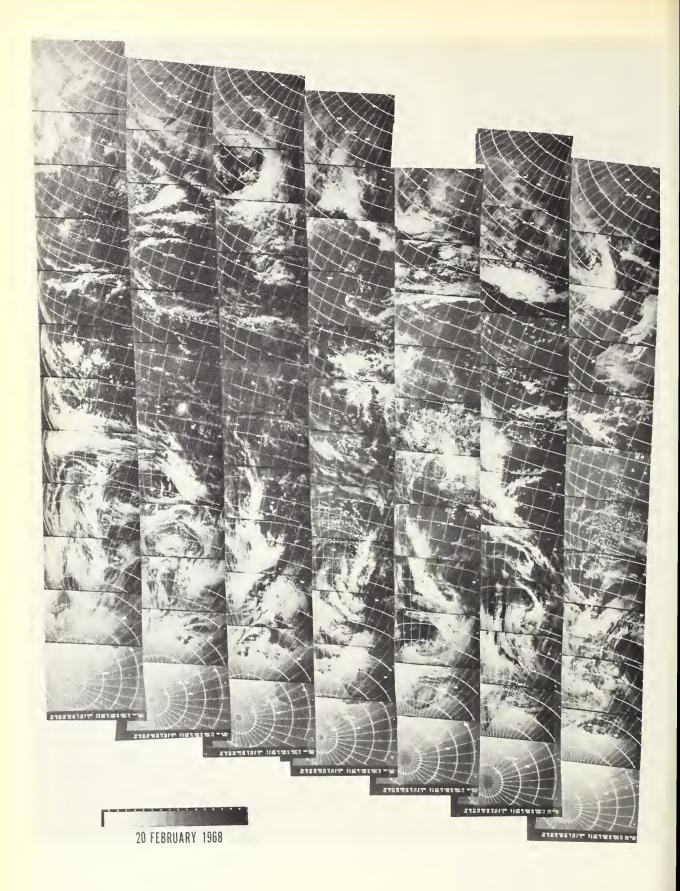


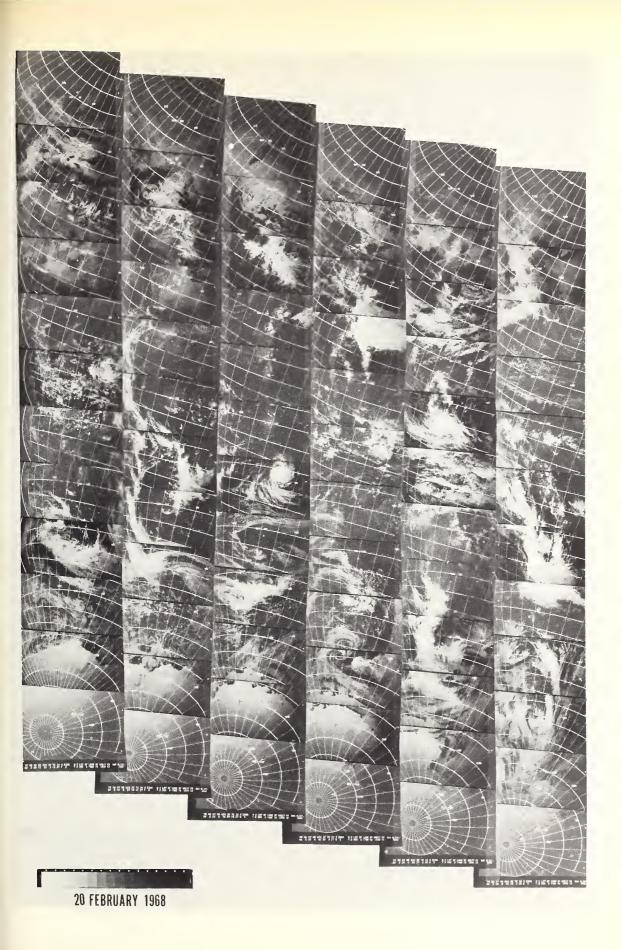


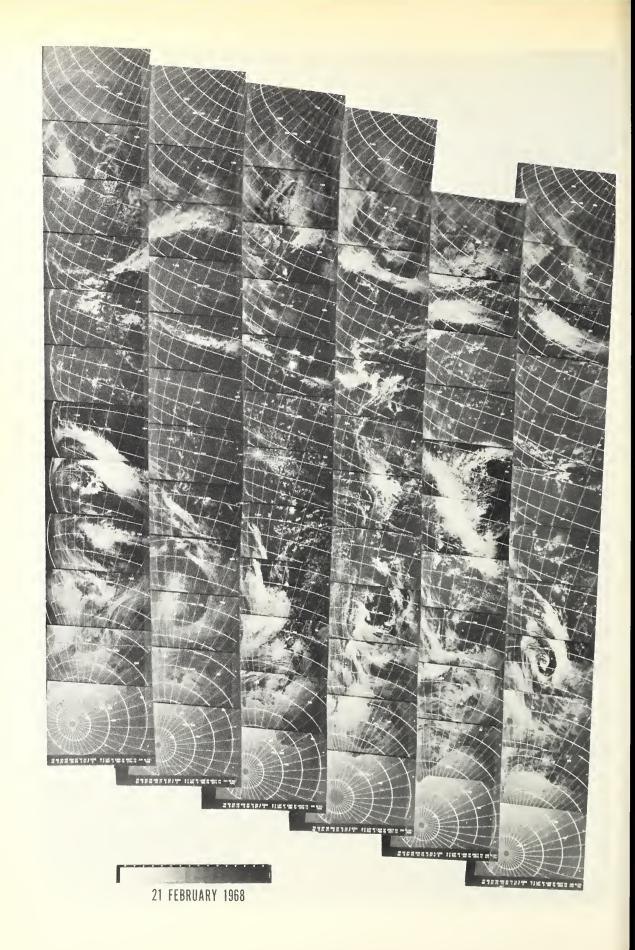


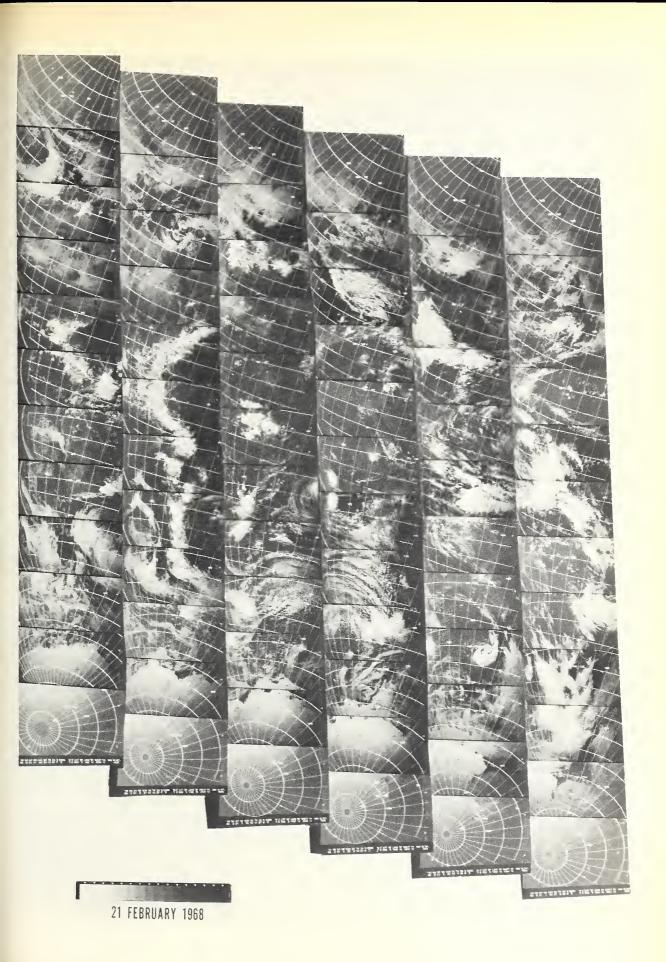




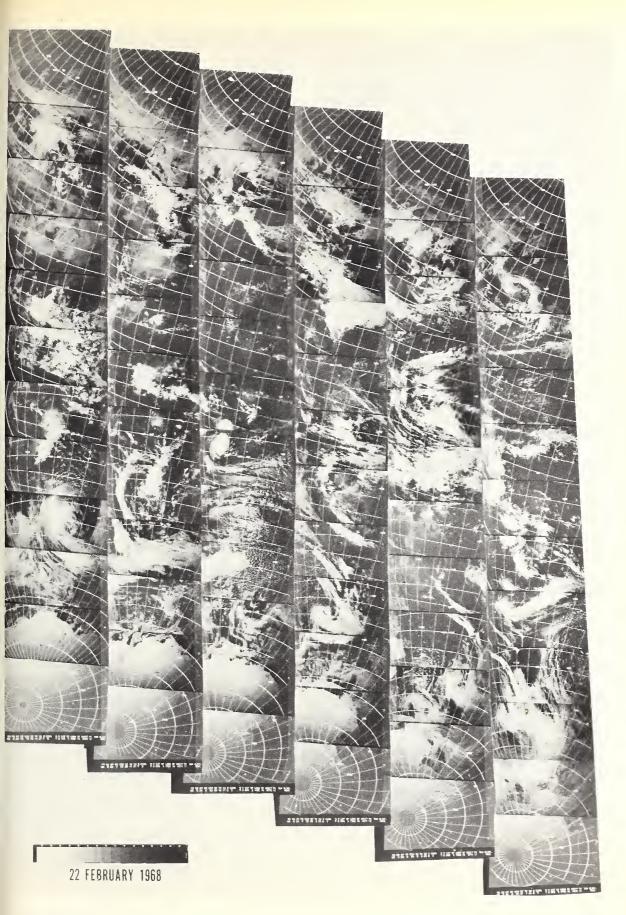


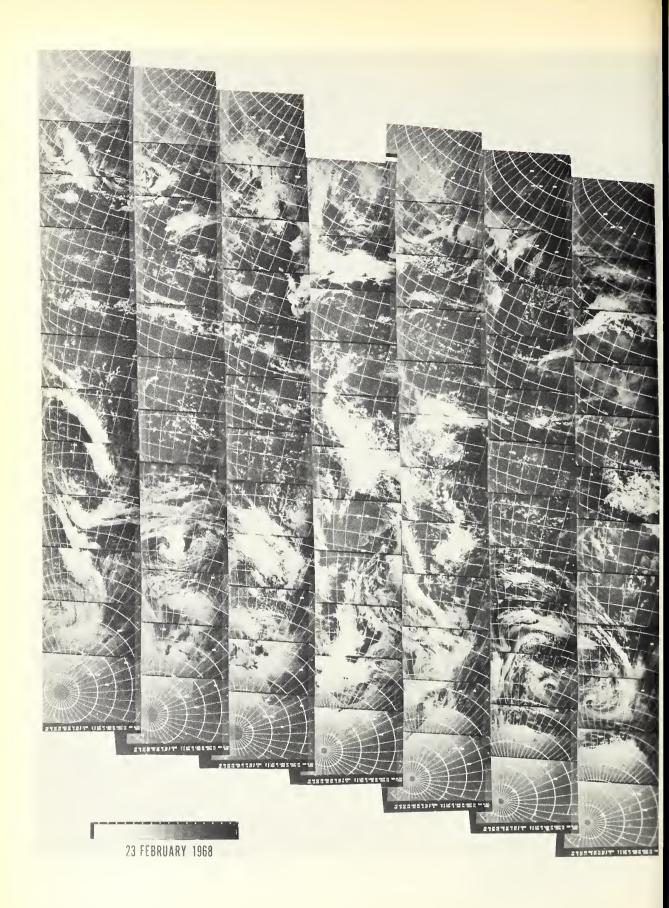


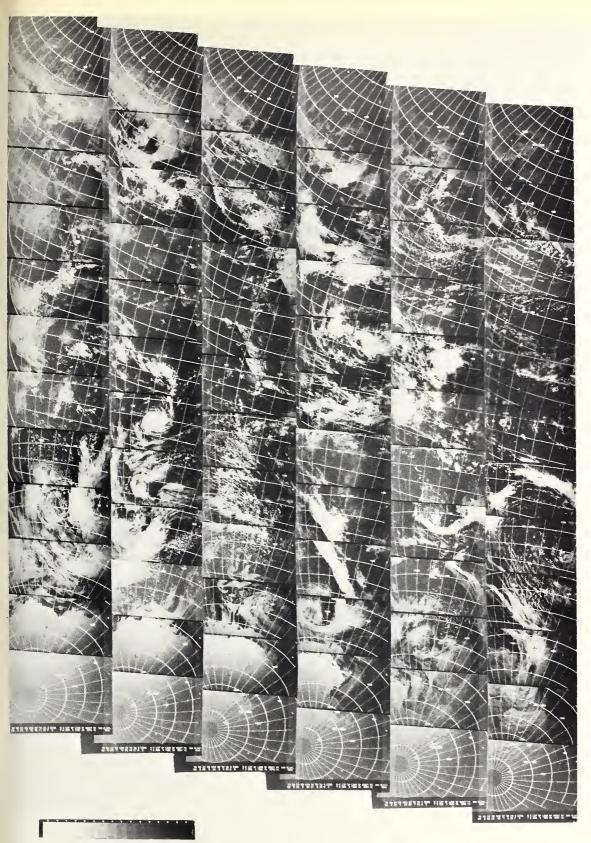


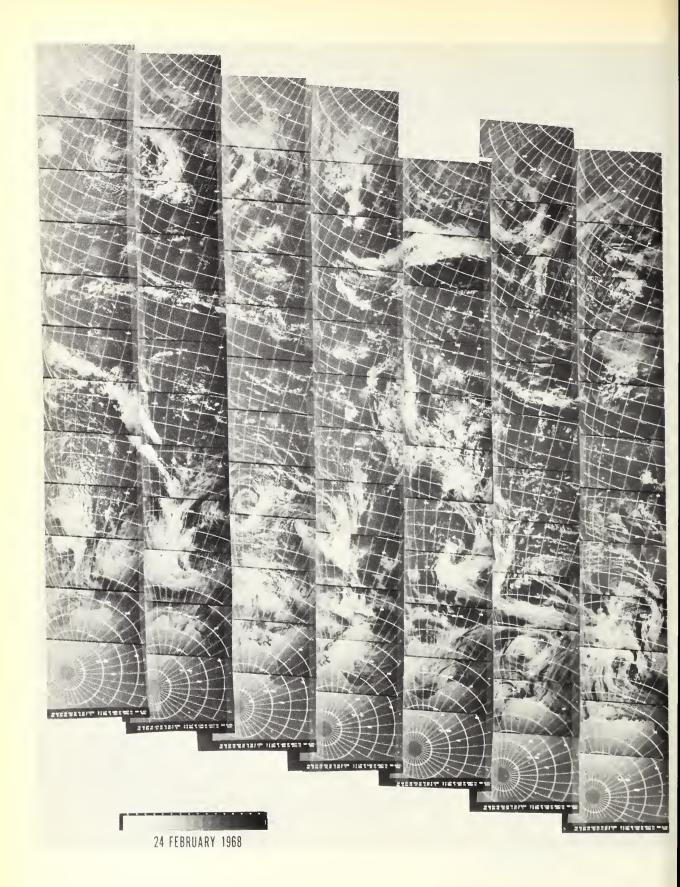


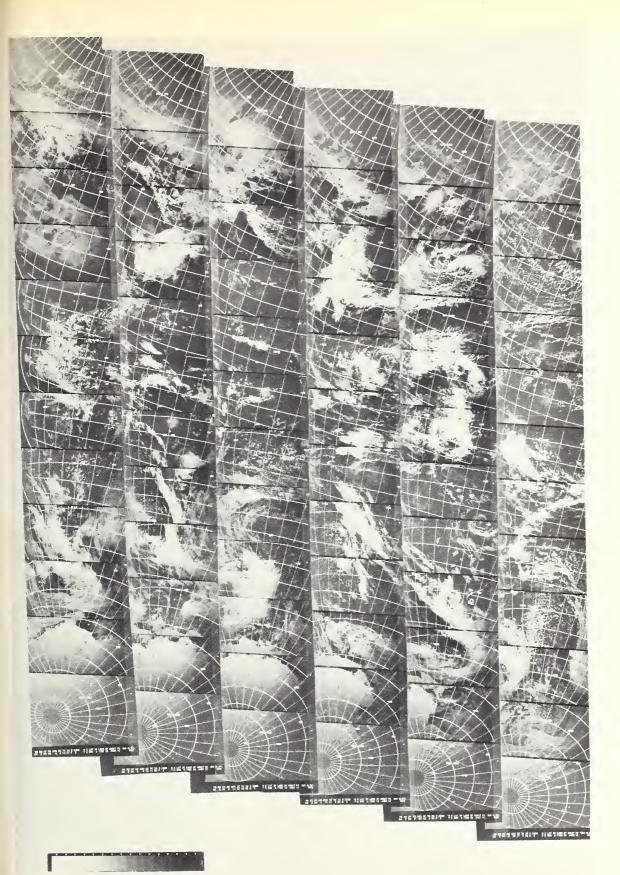


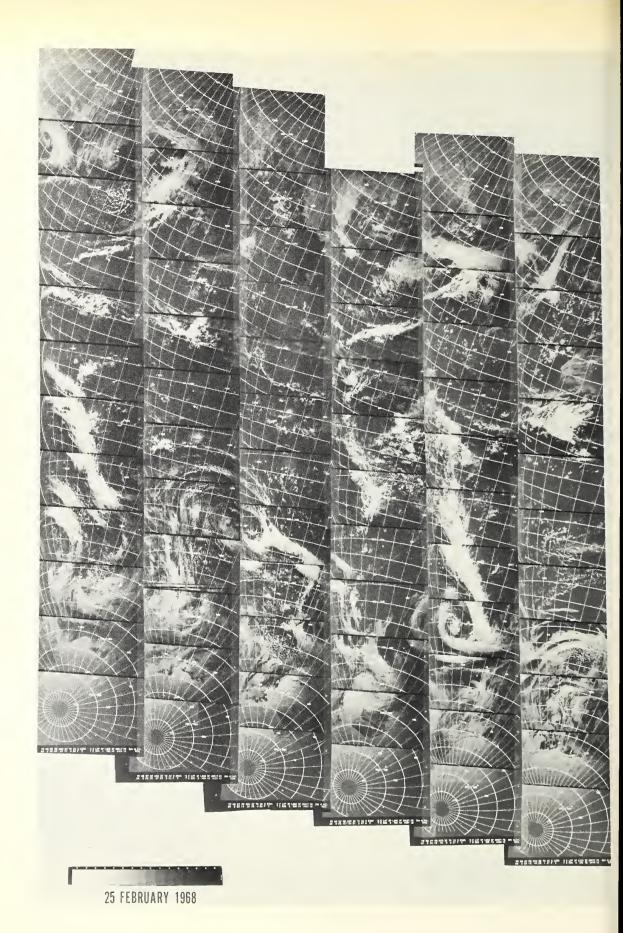


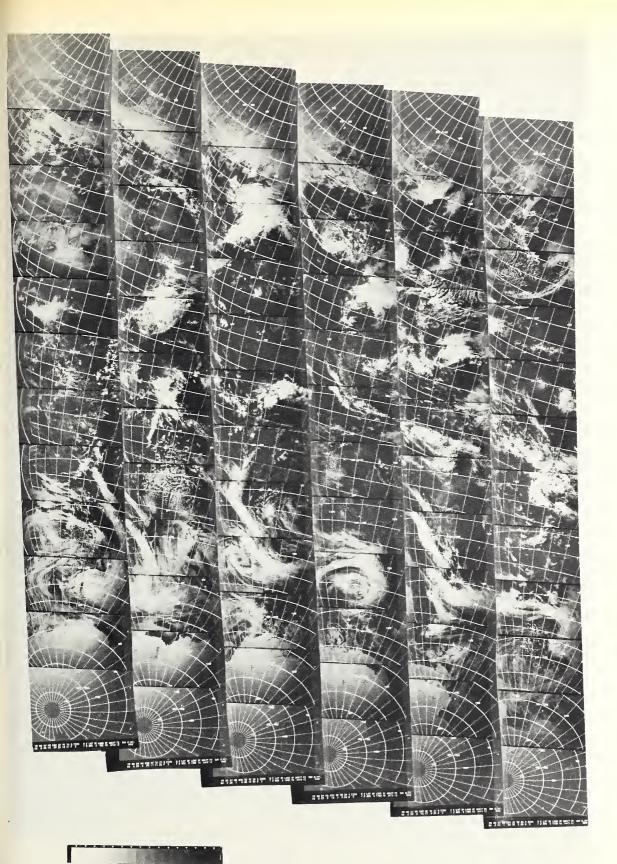




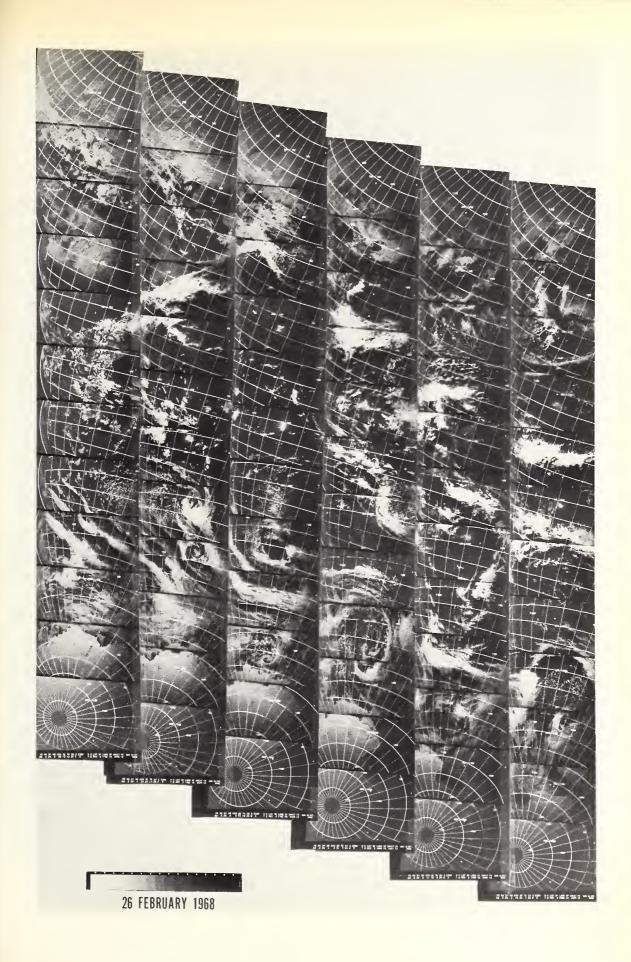


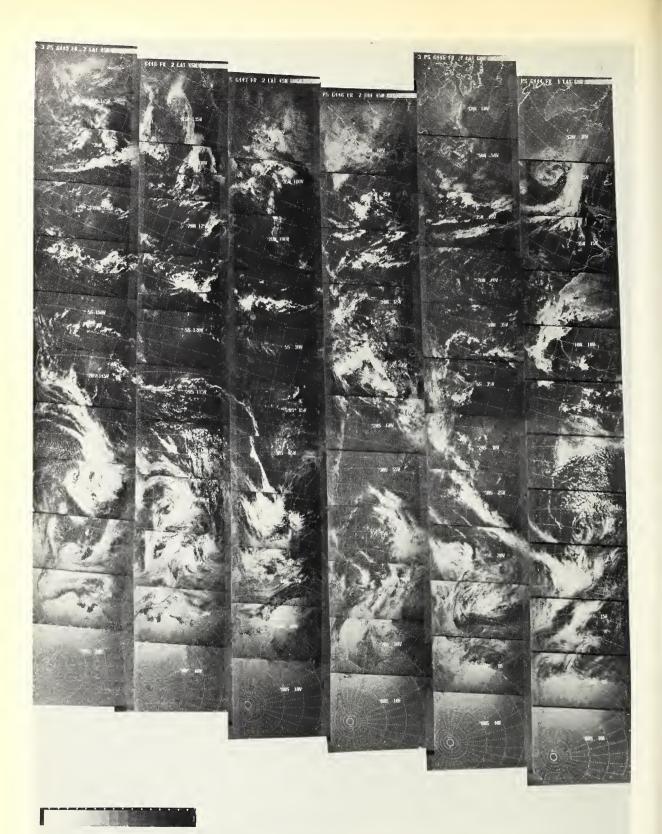


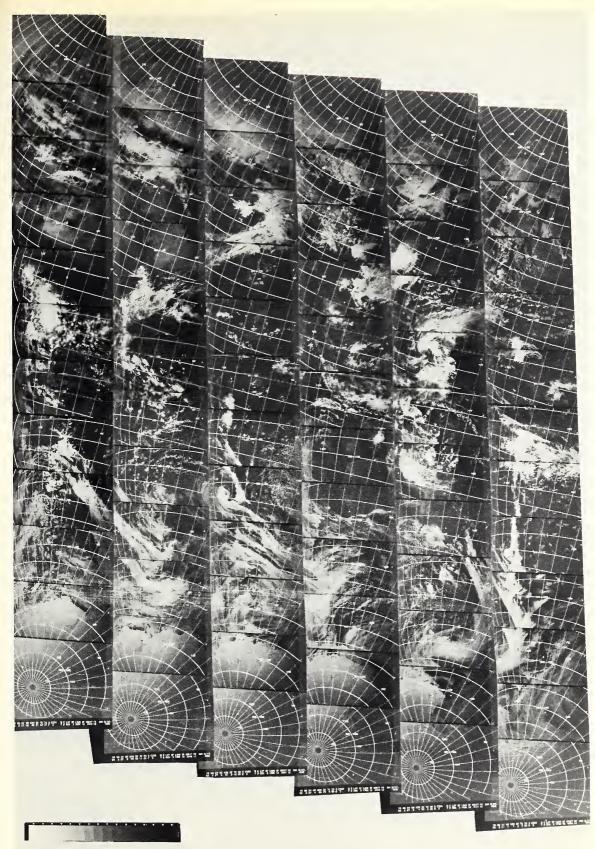








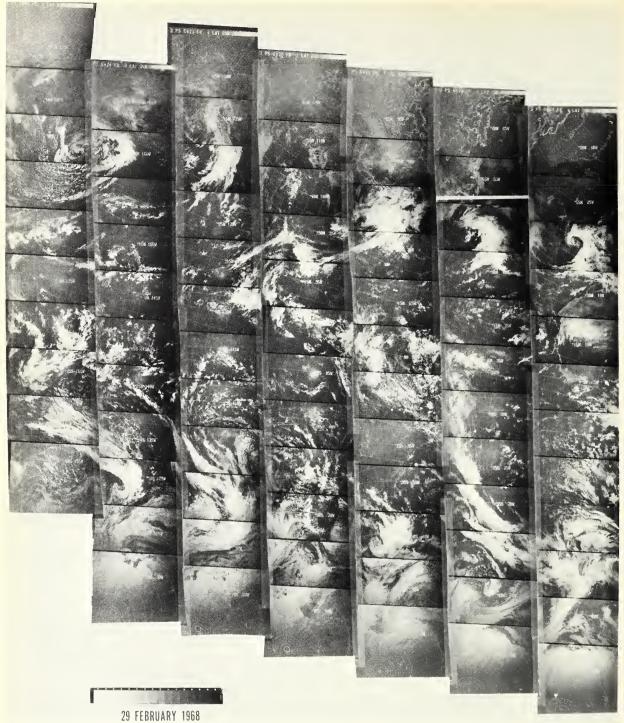


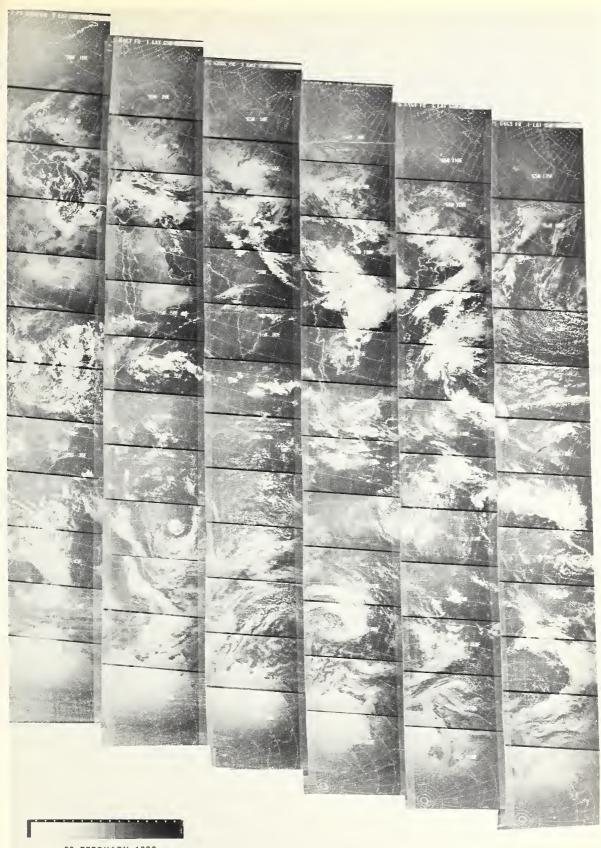




28 FEBRUARY 1968





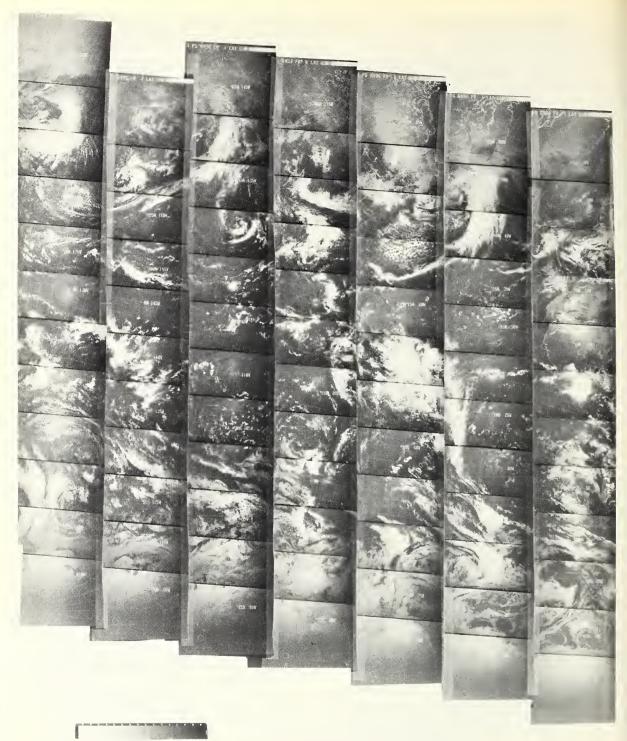


29 FEBRUARY 1968

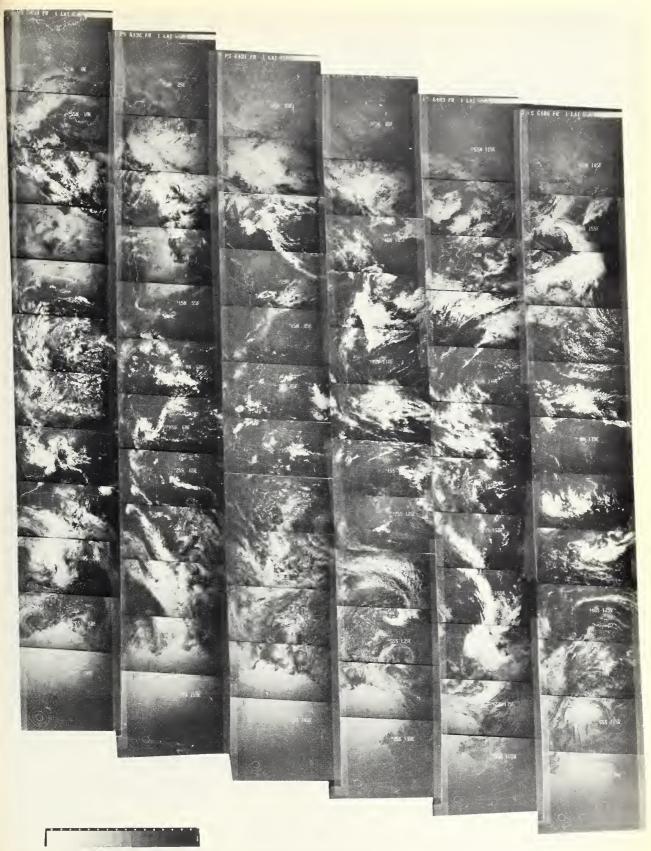




1 MARCH 1968



2 MARCH 1968



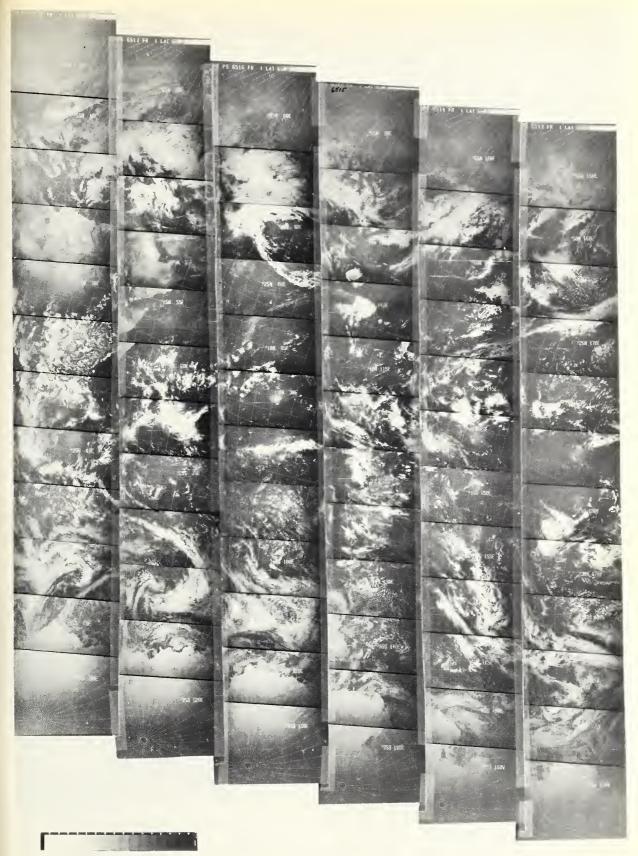
2 MARCH 1968





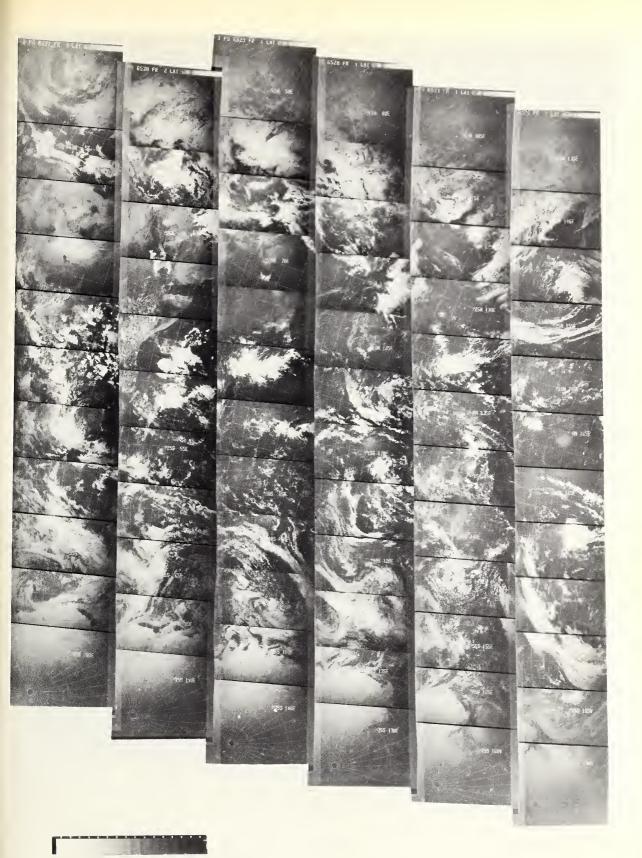


4 MARCH 1968

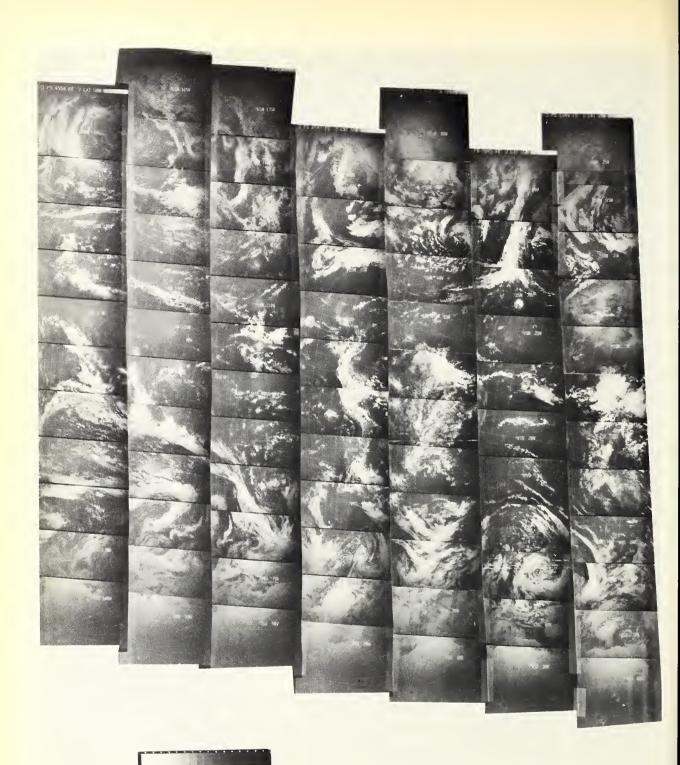


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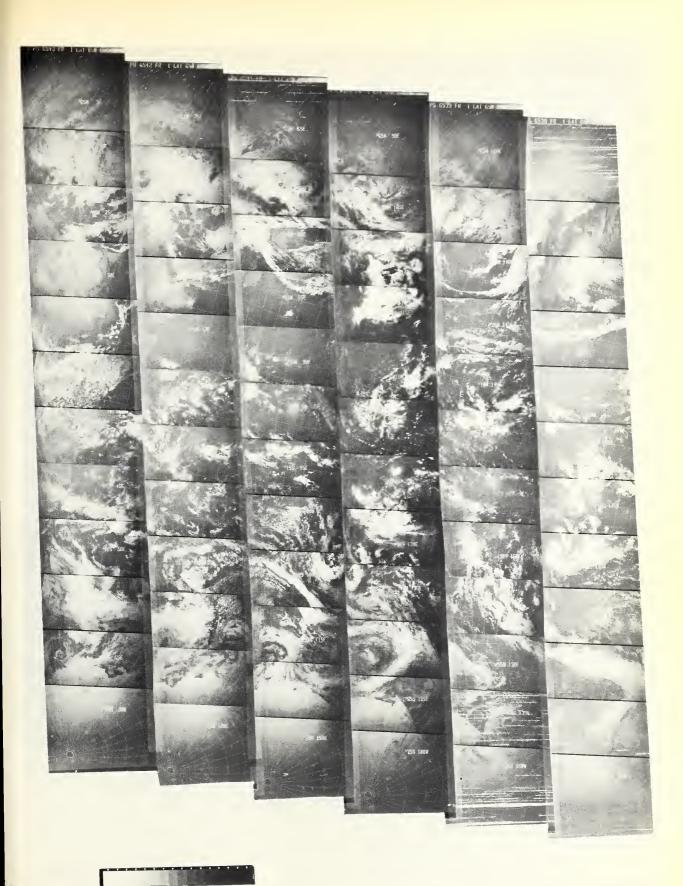


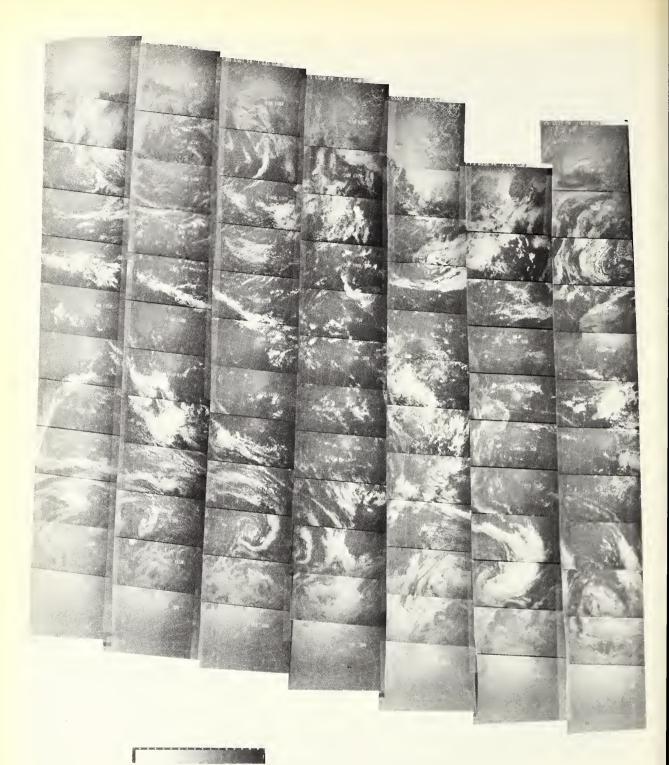


5 MARCH 1968

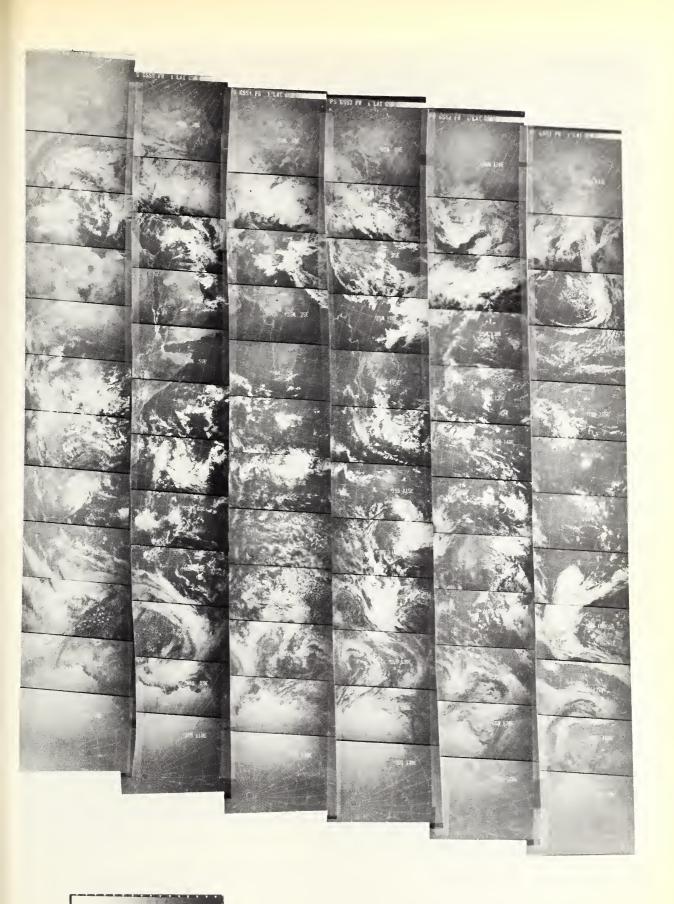


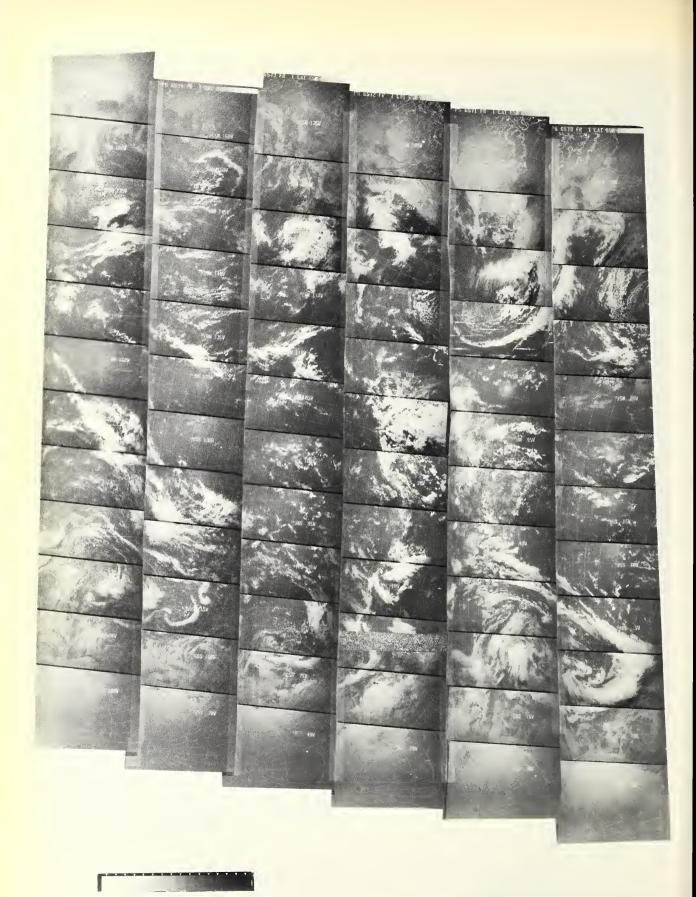
6 MARCH 1968

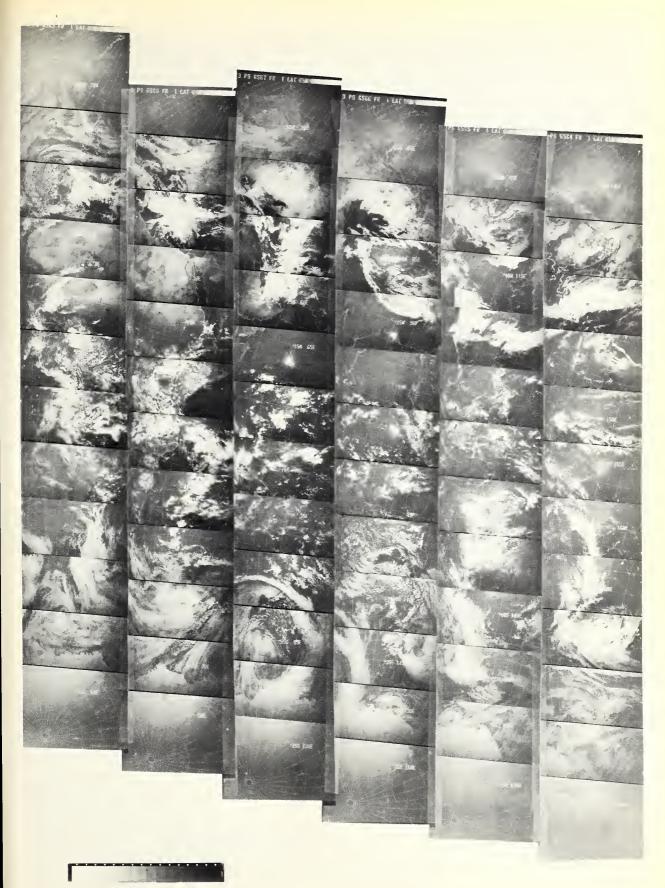




7 MARCH 1968

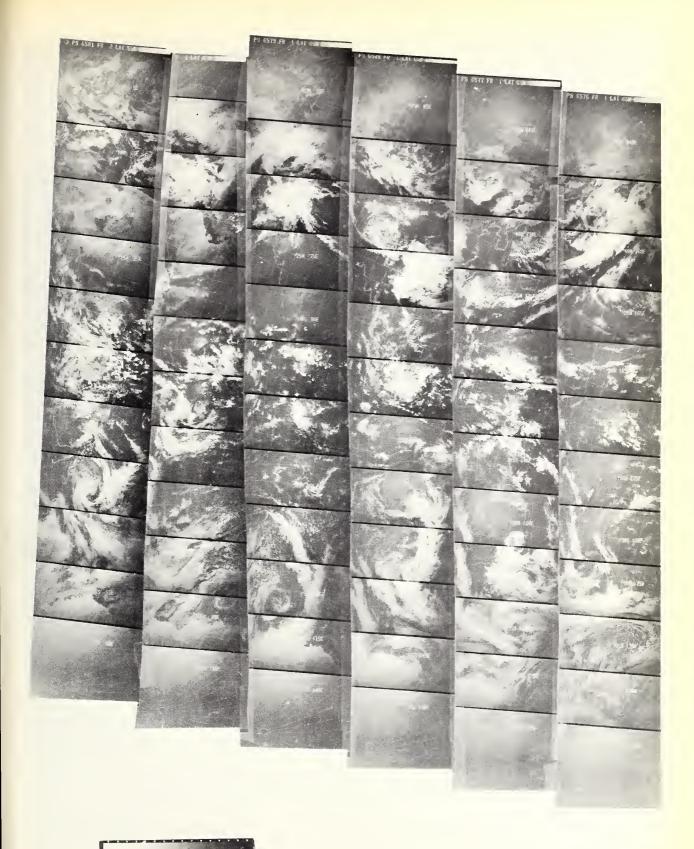








9 MARCH 1968

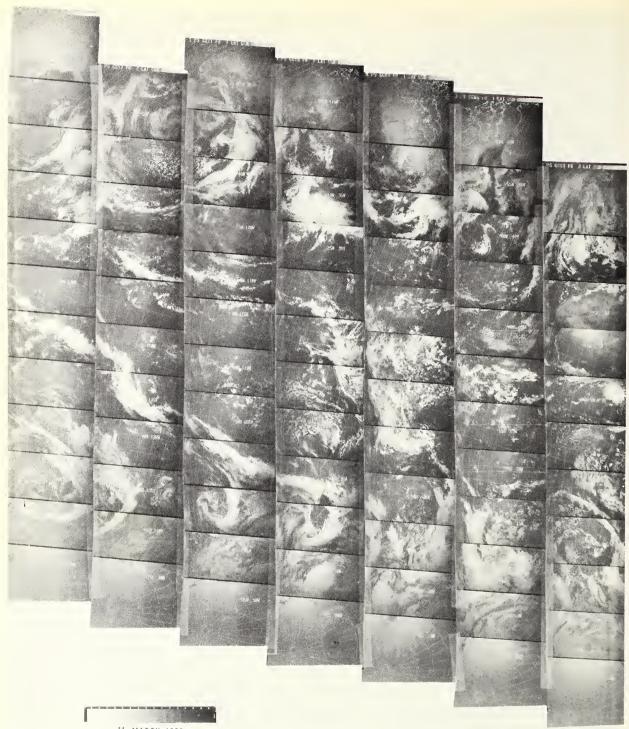


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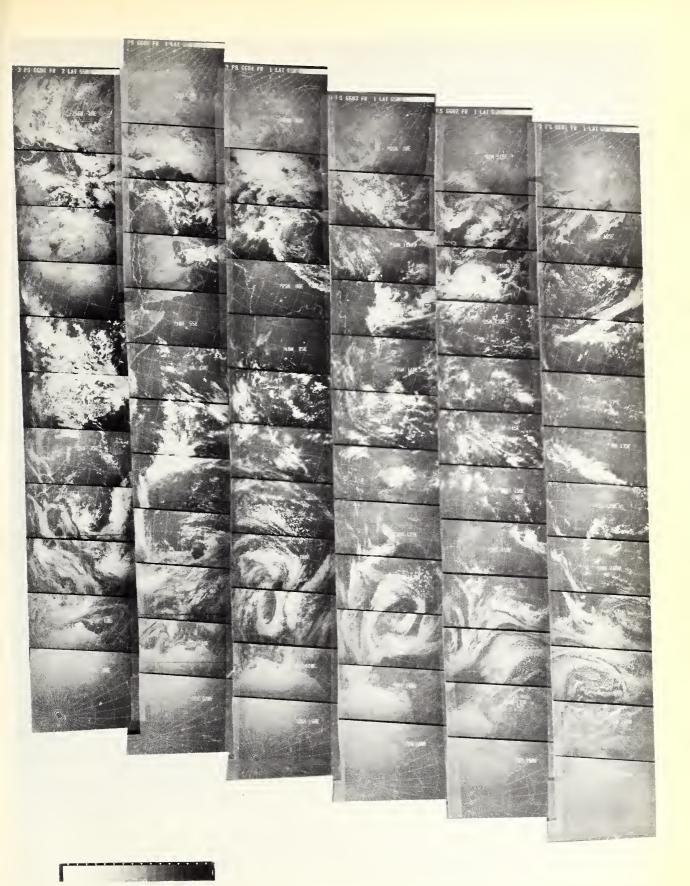




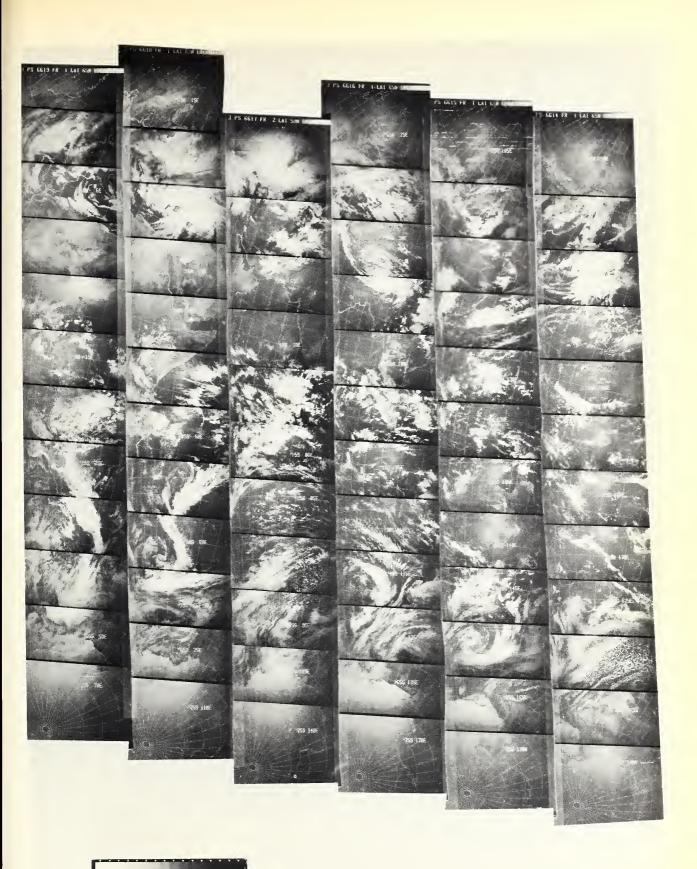
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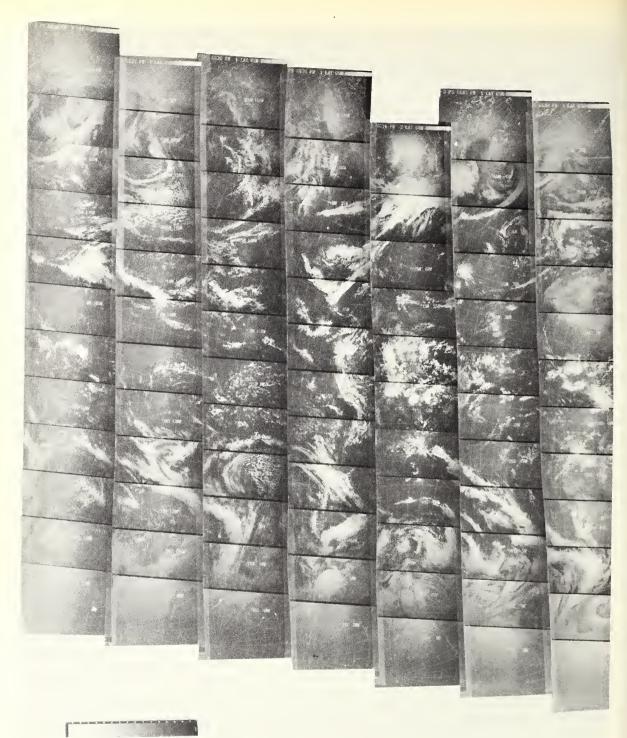


11 MARCH 1968

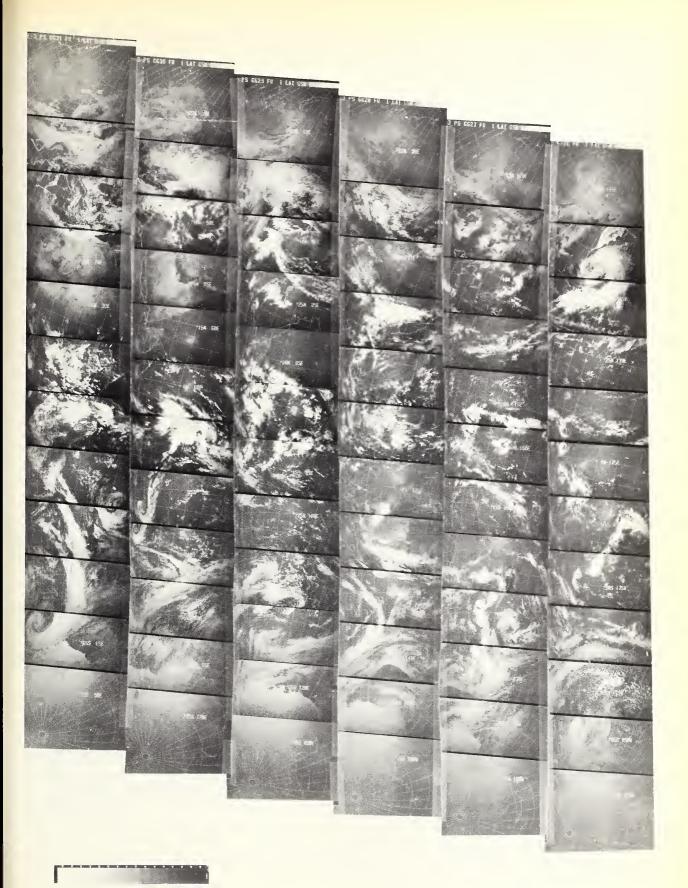


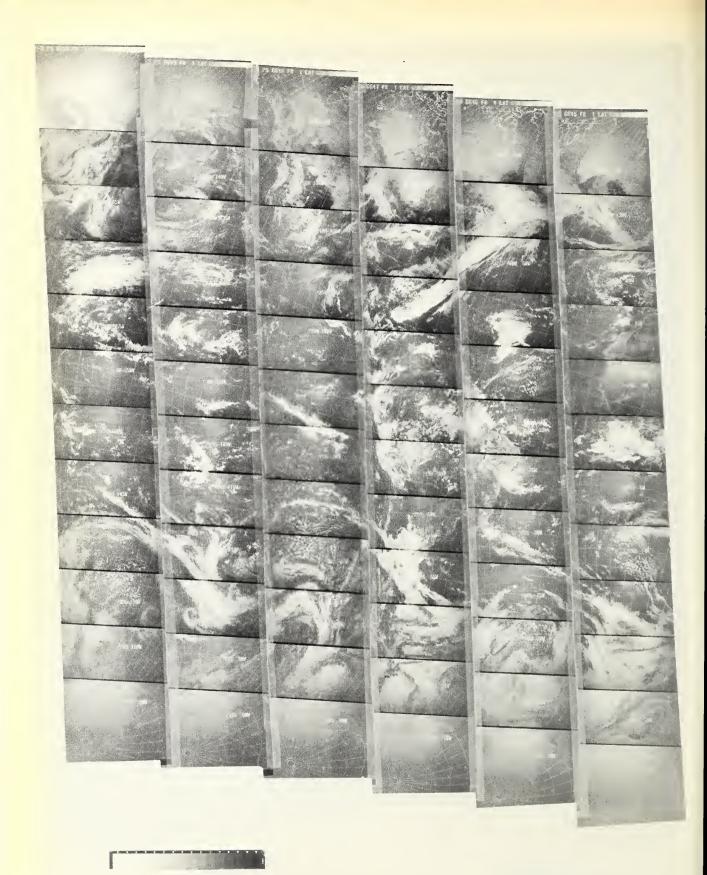


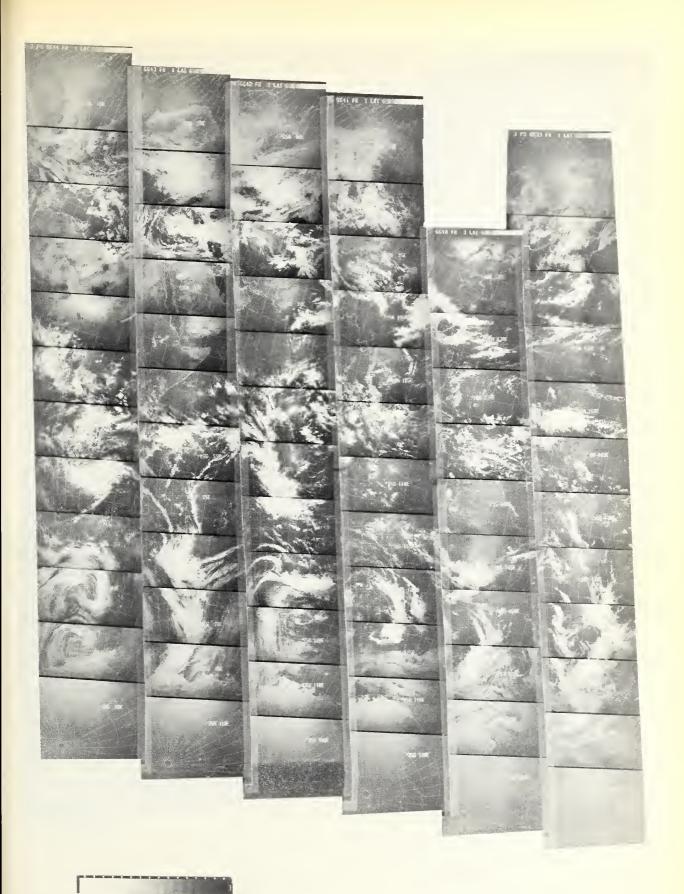


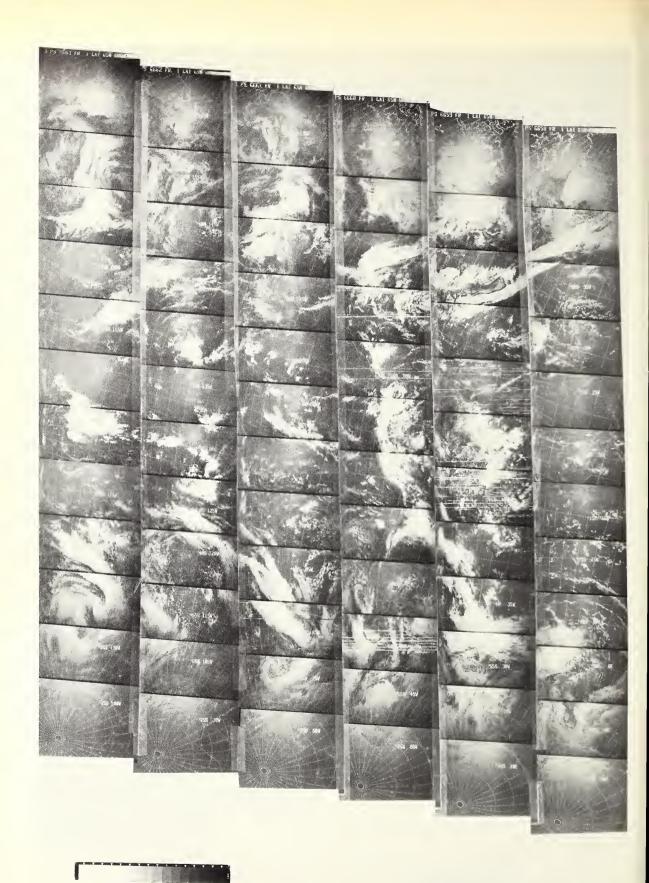


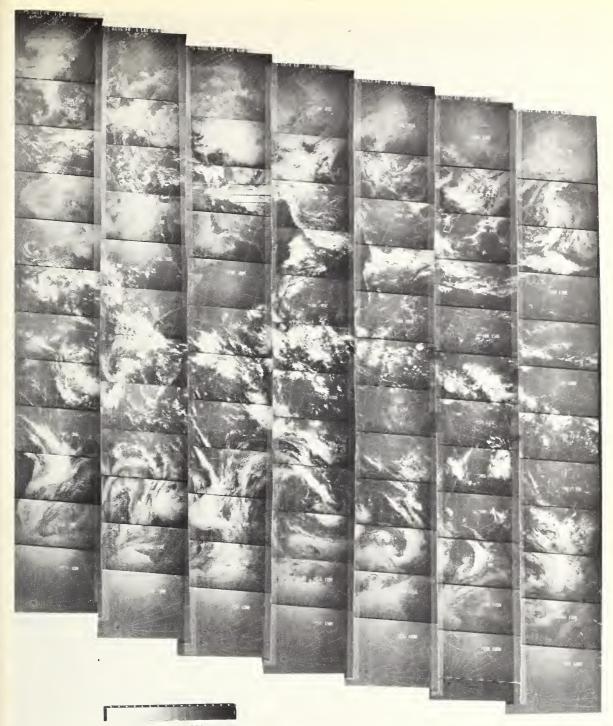
13 MARCH 1968







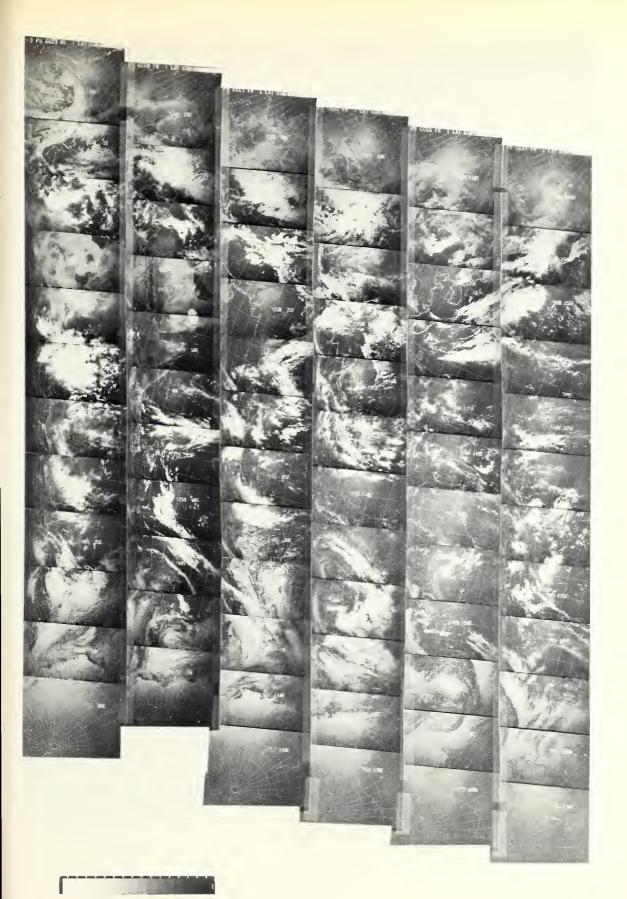


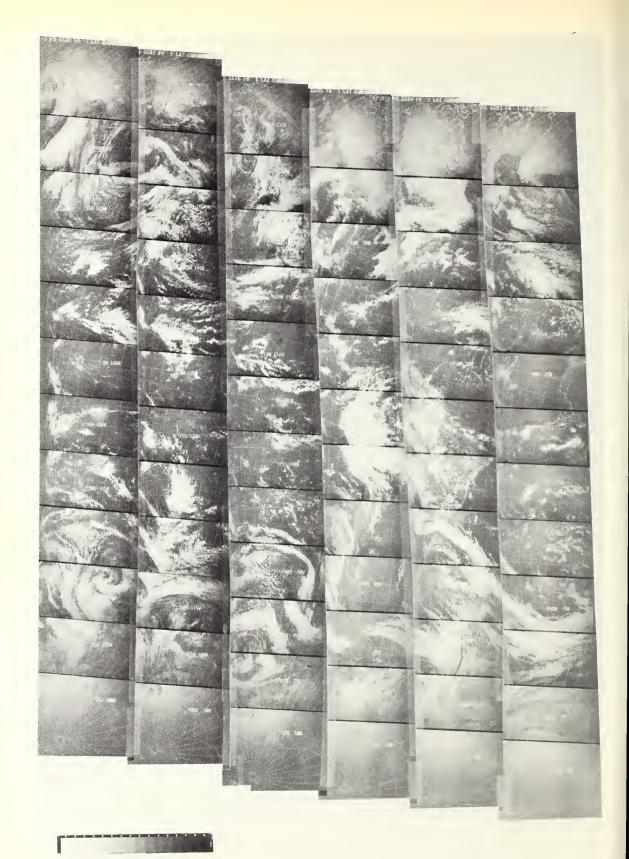


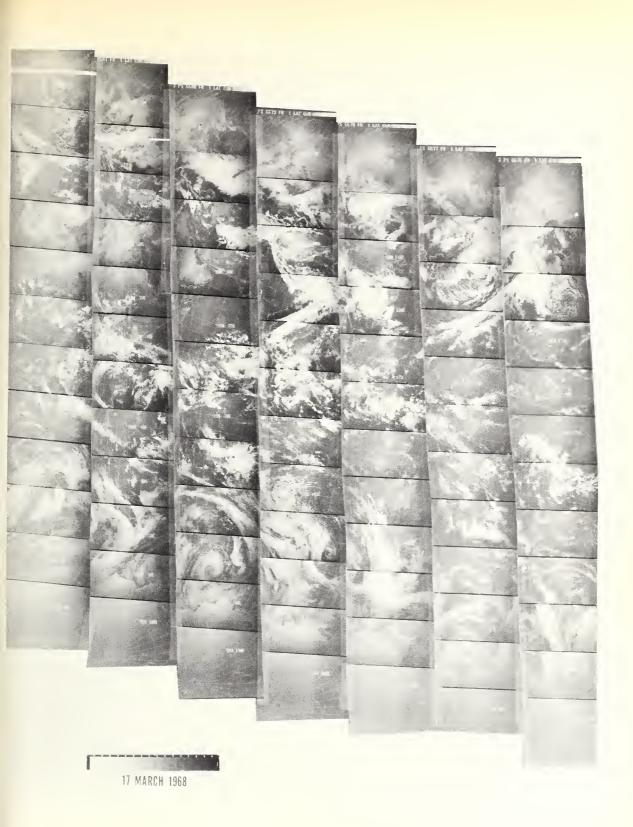
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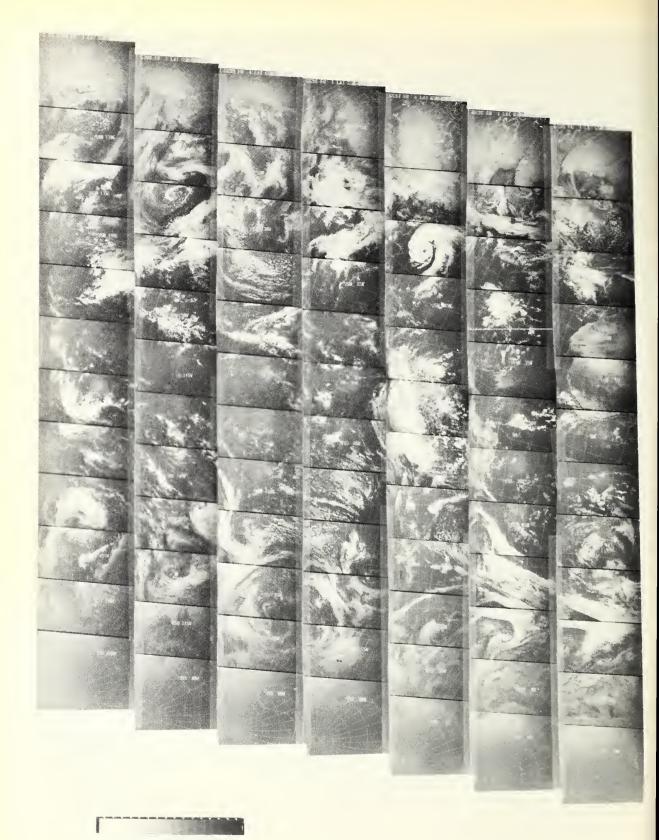


'16 MARCH 1968









18 MARCH 1968





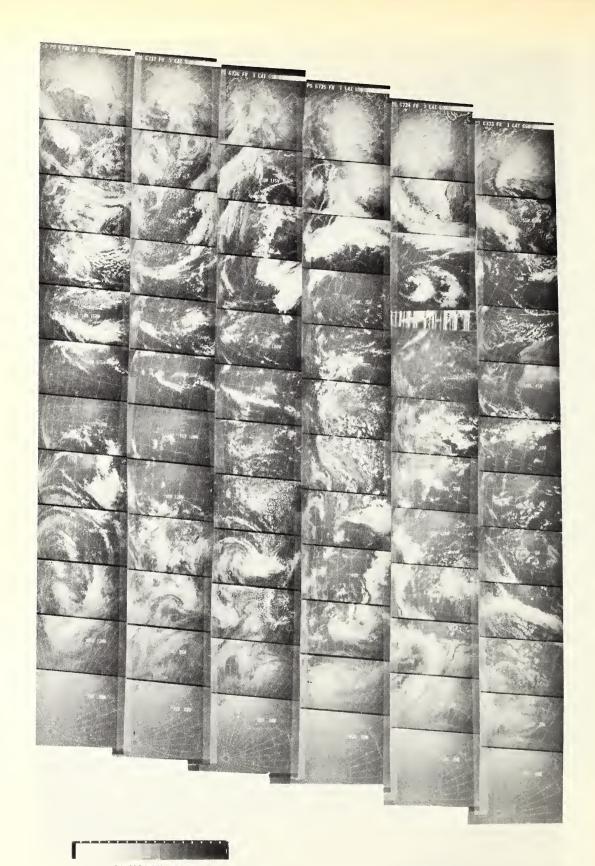
19 MARCH 1968

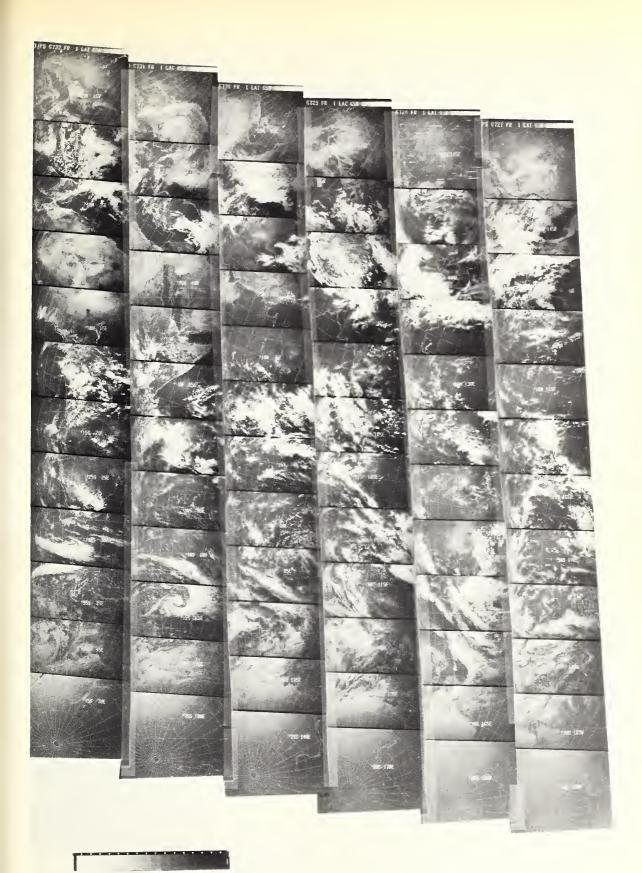


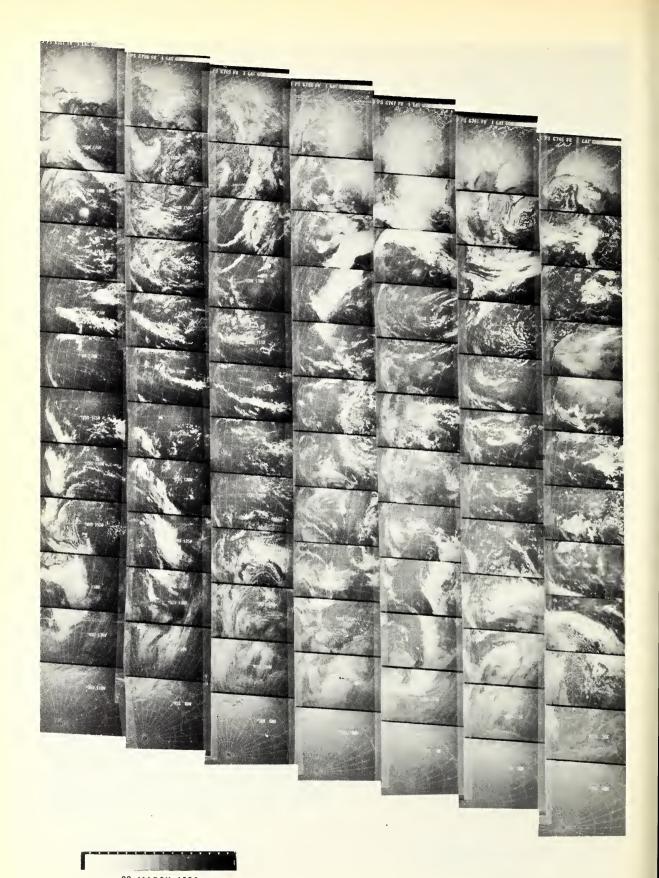


20 MARCH 1968

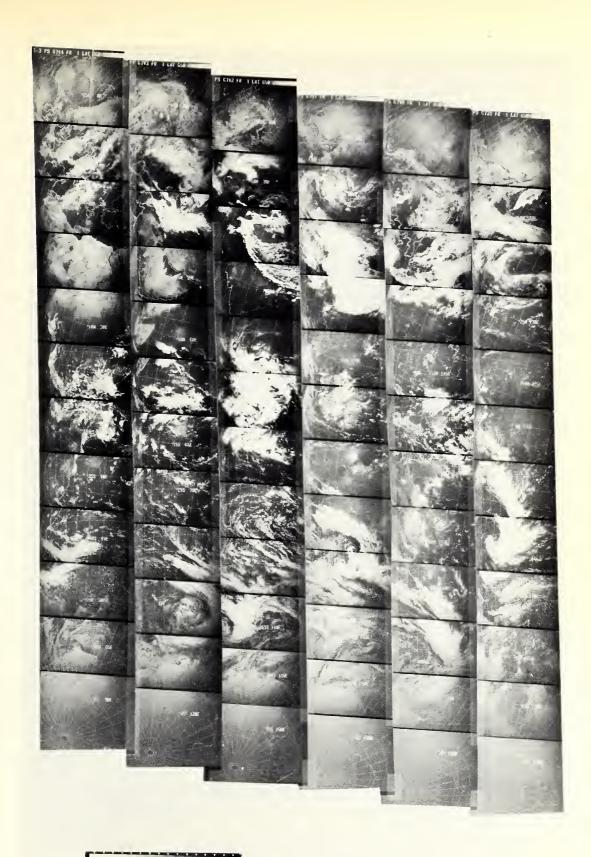


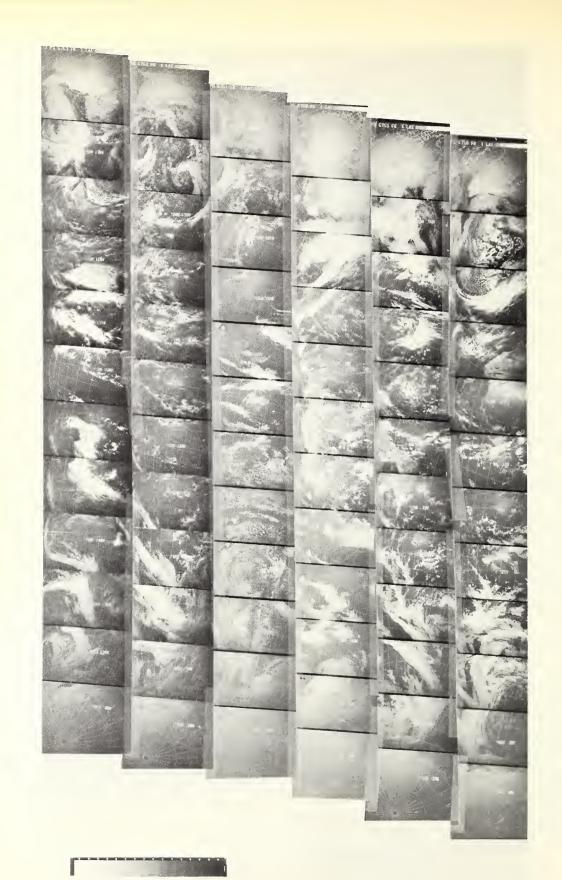


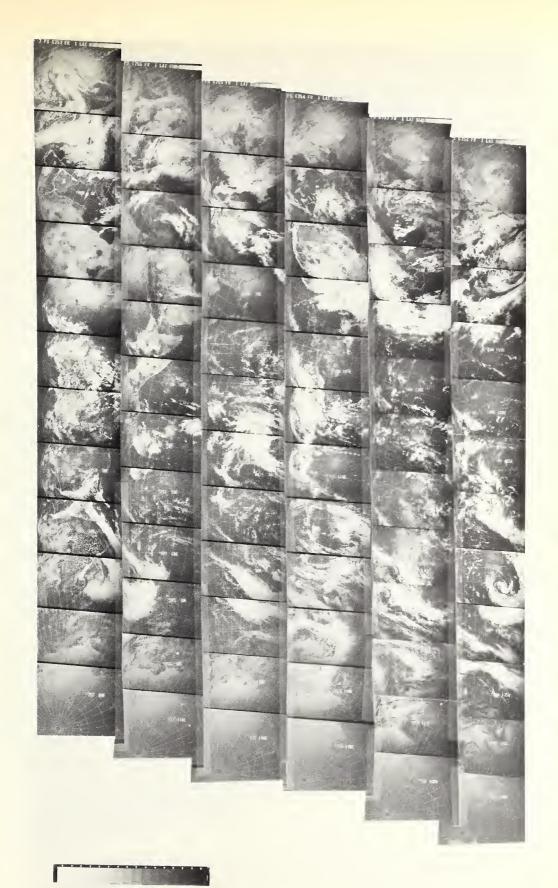


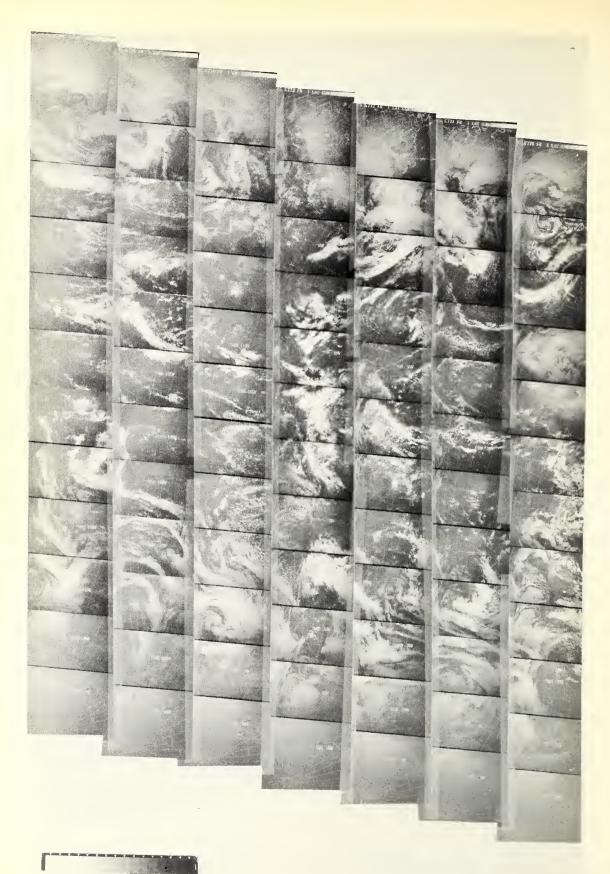


22 MARCH 1968

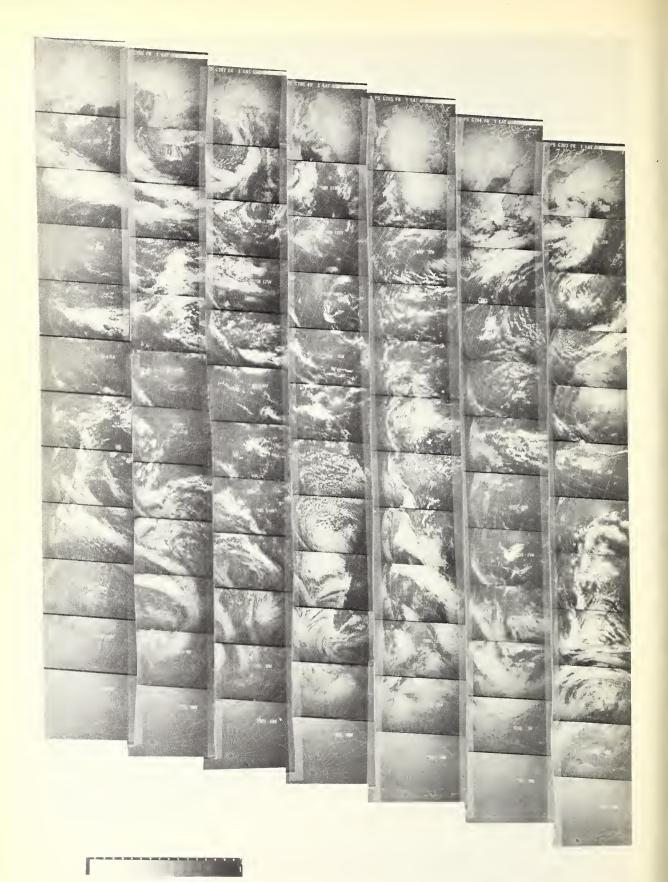




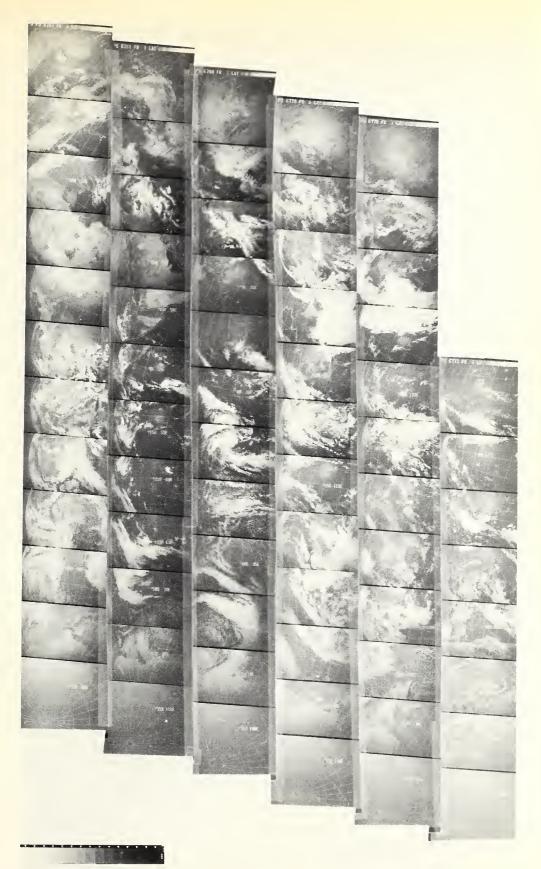




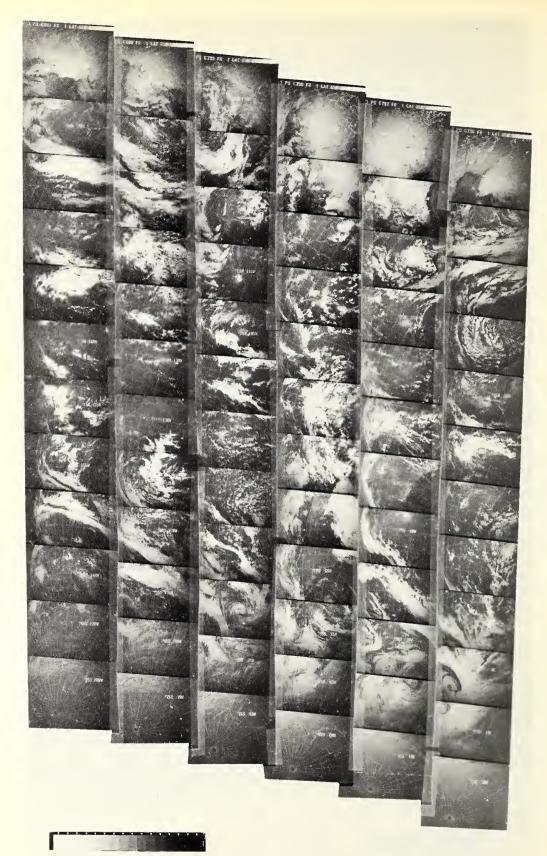




25 MARCH 1968



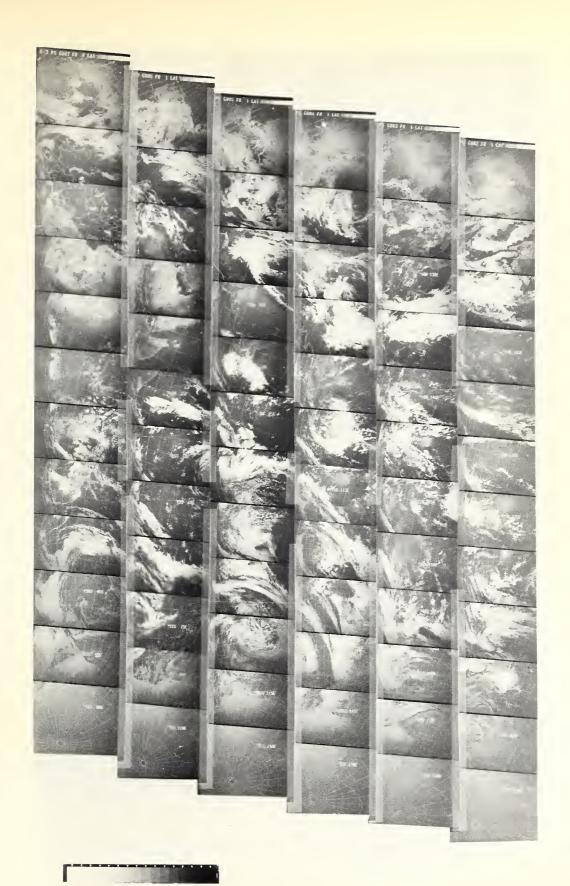
25 MARCH 1968

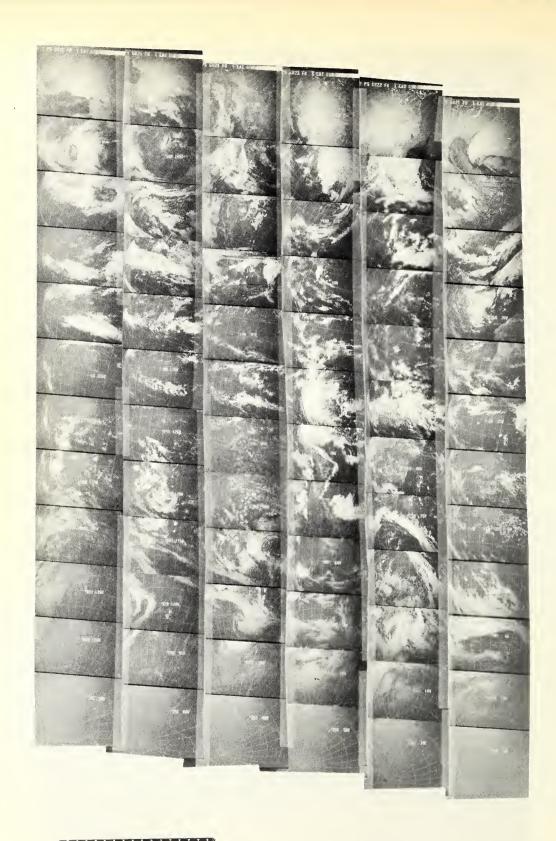




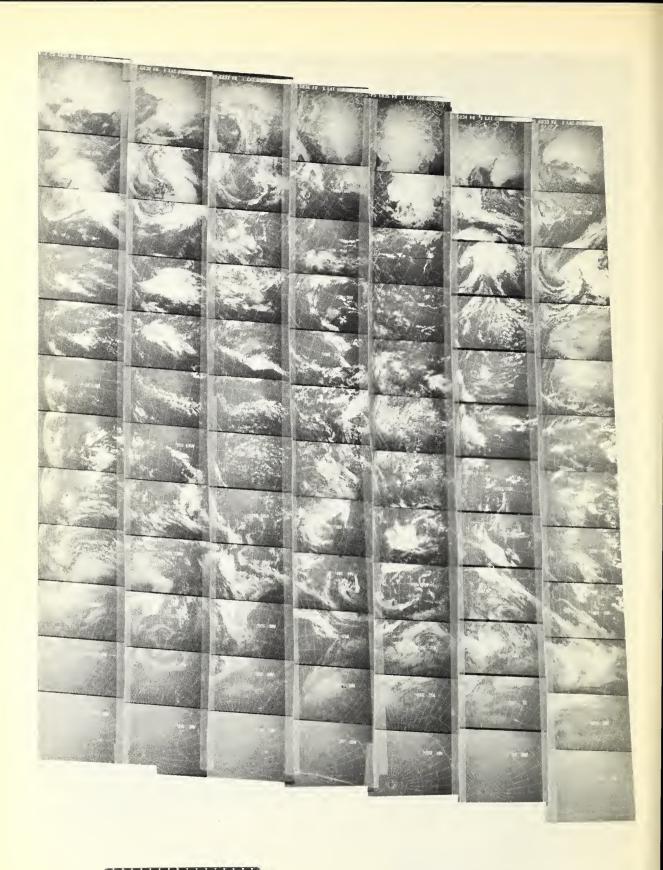
26 MARCH 1968

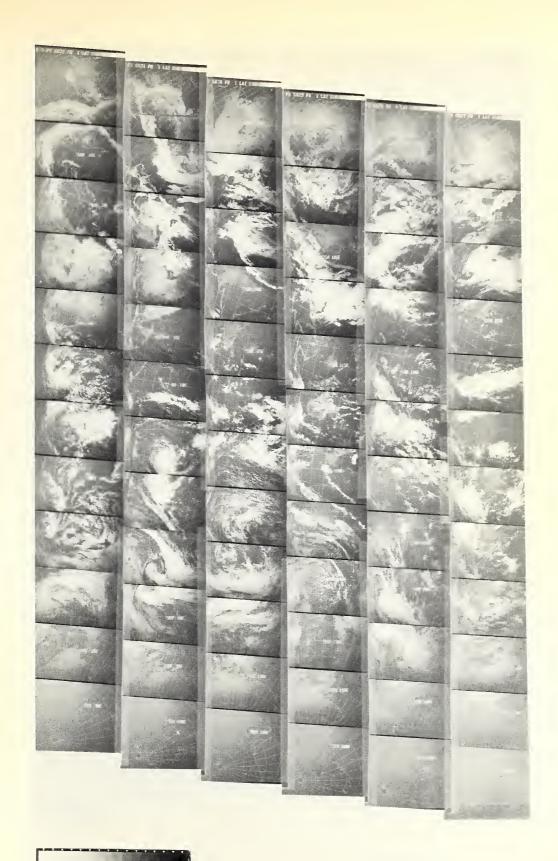


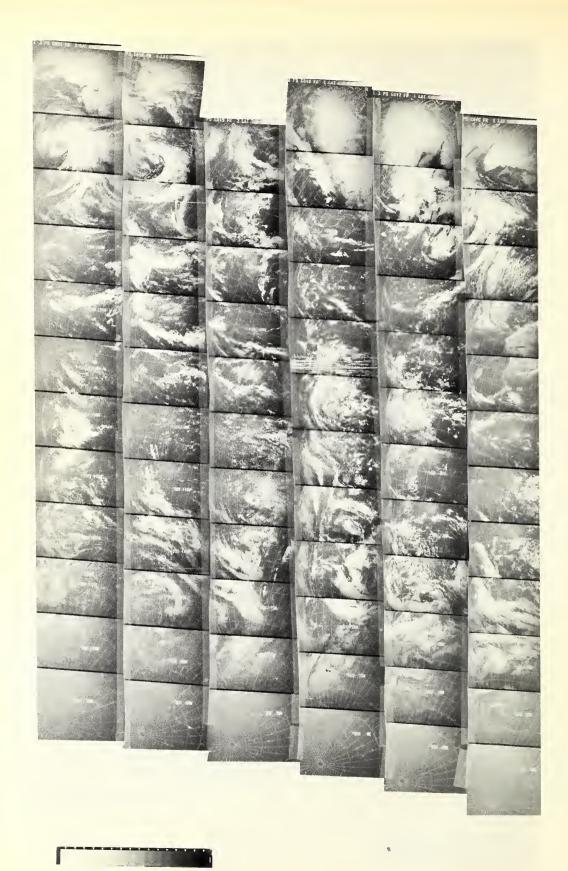


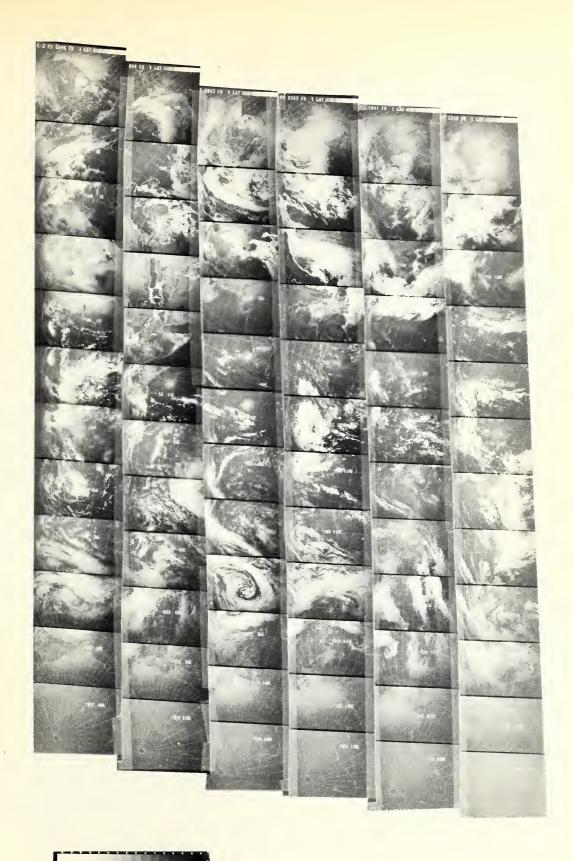


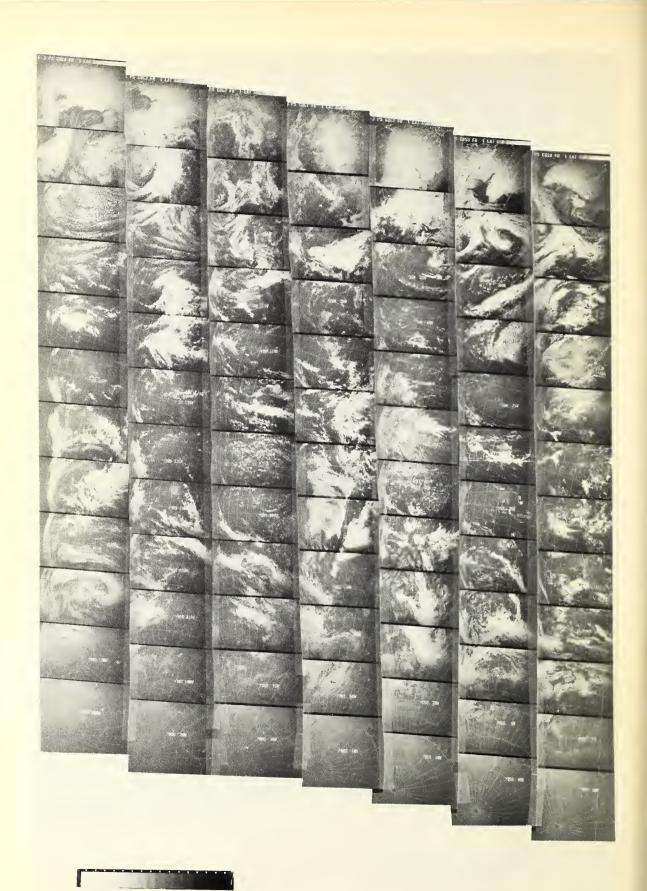


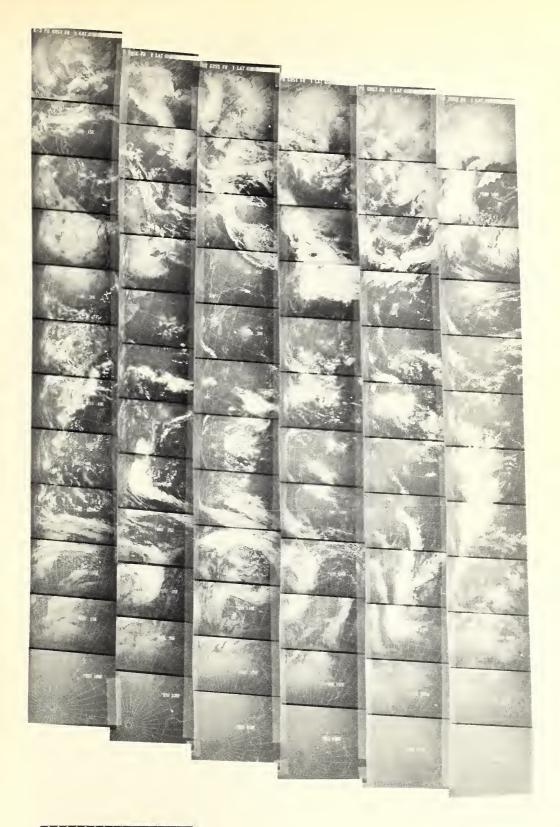


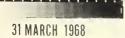


















- No. 5.38 "Catalogue of Meteorological Satellite Data TIROS VIII Television Cloud Photography Part 3 January 1, 1965 to August 31, 1965", published in 1966, price 45 cents.
- No. 5.39 "Catalogue of Meteorological Satellite Data TIROS IX Television Cloud Photography Part 1 January 22, 1965 to April 30, 1965", published in 1966, price \$1.75.
- No. 5.39 "Catalogue of Meteorological Satellite Data TIROS IX Television Cloud Photography Part 2 May 1, 1965 to July 26, 1965", published in 1967, price \$1.25.
- No. 5.310 "Catalogue of Meteorological Satellite Data TIROS X Television Cloud Photography Part 1 July 2, 1965 to September 30, 1965", published in 1967, price \$1.25.
- No. 5.311 "Catalogue of Meteorological Satellite Data ESSA 1 Television Cloud Photography Part 1 February 3, 1966 to March 31, 1966", published in 1966, price \$1.00.
- No. 5.311 "Catalogue of Meteorological Satellite Data ESSA 1 Television Cloud Photography Part 2 April 1, 1966 thru October 6, 1966", published in 1968, price \$1.75.
- No. 5.313 "Catalog of Meteorological Satellite Data ESSA 3 Television Cloud Photography Part 1 October 4, 1966 to January 1, 1967", published in 1968, price 75 cents.
- No. 5.313 "Catalog of Meteorological Satellite Data ESSA 3 Television Cloud Photography Part 2 January 1, 1967 to March 31, 1967", published in 1967, price \$1.50.
- No. 5.314 "Catalog of Meteorological Satellite Data ESSA 3 and ESSA 5 Television Cloud Photography April 1, 1967 to June 30, 1967", published in 1968, price \$1.75.
- No. 5.315 "Catalog of Meteorological Satellite Data ESSA 3 and ESSA 5
 Television Cloud Photography July 1, 1967 to September 30, 1967",
 published in 1968, price \$2.00.
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